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## DISEASES CAUSED BY BACTERIA AND FUNGI

Shibata, T., Itikawa, O., Minamimoto, S. & Ishii, F. (1959). **[Etiological studies on bovine mastitis. II. Histopathological findings on materials collected in slaughterhouse.]**—Bull. Nat. Inst. Anim. Hlth, Tokyo No. 37 pp. 99-111. [In English. Summary in Japanese pp. 97-98.] 323

Udders were studied at random from 75 slaughtered cows at various stages of lactation and were examined histologically. The findings were classified and tabulated and related to the presence or absence of bacteria.—R.M.

Hyde, J. L. (1959). **The effects of the local application of a hyperkeratotic chemical on morphology of the bovine teat canal and susceptibility to swab exposures with Streptococcus agalactiae.** — Thesis, Cornell pp. 39. 324

This is an attempt to determine if chlorinated naphthalene (Halowax 1014) when swabbed in the teat canal on three successive days following the evening milking would render the udder more or less susceptible to *Str. agalactiae* infection. H. concludes that the local application of the chemical did not alter resistance or susceptibility to the infection.

—H. L. Gilman.

Spears, H. N. & Davidson, J. C. (1959). **Anthrax.**—Vet. Rec. **71,** 637-643. [Authors' summary modified.] 325

A synopsis of the incidence and general features of anthrax and its control in Great Britain.

Pritulin, P. I. & Kuz'min, N. A. (1959). **[More rapid diagnosis of anthrax by using luminescent antibody.]**—Veterinariya, Moscow **36,** No. 7 pp. 69-73. [In Russian.] 326

Anthrax precipitating serum purified by precipitation with ammonium sulphate, was labelled with fluorescein isocyanate. This was used in 1,161 tests to identify anthrax bacilli on oats and hay and in cultures and to distinguish it from anthracoid organisms, including *Bacillus subtilis,* by fluorescence microscopy. It took 60–90 min. to obtain a positive result. The method was also successful with smears of blood or spleen from dead animals.

—R.M.

Molnár, I. (1959). **Immunization experiments with the protective antigen of the anthrax bacillus.**—Acta vet. Acad. Sci. hung. **9,** 175-182. [In English.] 327

For the preparation of an aluminium hydroxide gel protective antigen vaccine for sheep, freshly prepared strains of *B. anthracis* were cultured in Boor's medium containing sheep serum albumin and fresh yeast extract. Best antigen yields were obtained from thin layers of medium inoculated with 10–15,000 spores and incubated for 16–18 hours. The vaccine proved innocuous for rabbits and protected them against challenge with 3,000 virulent anthrax spores. When given in 3-ml. doses to 650 sheep in the laboratory or on farms, none had troublesome reactions and all except one survived challenge with 15–75,000 virulent spores at 21 days, 3 months and 7 months after vaccination.—A. Ackroyd.

Barnes, J. E. (1959). **Tuberculosis in beef cattle.**—Aust. vet. J. **35,** 351. 328

Details are given of tuberculin testing on a 1,300 sq. mile property in Northern Territory.—A. Culey.

Ranney, A. F. (1959). **Status of Federal-State cooperative tuberculosis eradication.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 167-174. 329

In the U.S.A. in 1958, 8·88 million cattle were tuberculin tested but only 15,361 were reactors. Sodium orthophenylphenate has been

found an effective disinfectant where the smell of cresylic disinfectants was a disadvantage. R. emphasizes that tracing of cattle found infected on slaughter is not satisfactory and some cannot be traced despite ear tags and branding. Although TB. in pigs has steadily declined, 2·8% of 1·64 million carcasses were positive. 10,000 of these were condemned, or passed conditionally. A gradual increase in the percentage of reactors for 4 consecutive years was disquieting.—W. K. DUNSCOMBE.

Kertay, N. & Jirkovsky, M. (1959). A Mycobacterium tuberkulosis típusainak meghatározása gümőkóros sertésekben. **[Typing tubercle bacilli from pigs.]** — Mag. állator. Lapja **14,** 187-188 & 189. [In Hungarian. Summaries in English and Russian.] 330

Of 117 specimens from 100 pig carcasses condemned in the abattoir with lesions characteristic of TB., 89 were considered on microscopic examination to be infected with tubercle bacilli while by animal inoculation only 75 proved positive; tests on rabbits and chickens indicated infection of the bovine type in 69, of the avian type in 3 and of the human type in a further 3 specimens. The remaining 14 microscopically positive specimens, which gave negative animal inoculation tests were all old, calcified lesions. Isolation of tubercle bacilli was successful in 46 specimens.

An account is given of the lesions found in the pigs affected by the human and avian type.—A. SEBESTENY.

Aldridge, C., Felton, F. G., Muchmore, H. G. & Ramsey, H. H. (1959). **A new liquid synthetic medium for the cultivation of Mycobacterium species.**—Amer. Rev. respir. Dis. **80,** 267-268. 331

The medium was composed of 5 g. monobasic potassium phosphate, 5 g. ammonium chloride, 1 g. magnesium citrate, 0·5 g. dibasic potassium sulphate, 0·2 ml. "Tween 80", 2·5 mg. ferric ammonium sulphate, and distilled water to make 980 ml. KOH was added until the pH was 6·8. The solution was sterilized and cooled and 20 ml. of sterile 50% glucose soln. was added.—R.M.

Iland, C. N. & Barker, R. M. (1959). **The use of skin ulcer measurements to estimate immunity against tuberculosis in the guinea-pig.**—Tubercle, Lond. **40,** 235-244. [Authors' summary modified.] 332

Normal non-immune g.pigs develop ulcerated swellings after i/d challenge with living vole bacilli which reach a maximum in about four weeks and then heal. G.pigs vaccinated with B.C.G. and then challenged with vole bacilli by the i/d route also develop ulcerated swellings; but they are smaller, appear more rapidly and heal more quickly than in the non-immune animal. The progress of these lesions reflects the speed of development of hypersensitivity and immunity and by comparing them in non-immune and vaccinated animals the degree of immunity can be estimated.

The comparison is more accurate if the effect of hypersensitivity is excluded and this was attempted by simultaneously challenging the animals in different sites with both killed and living vole bacilli. The measurements of the lesions produced by the 'dead' challenge were subtracted from those of the 'living' challenge and the resulting values were used in the assay.

Burtin, P. & Kourilsky, R. (1959). Recherches immunologiques sur les antigènes et haptènes solubles du bacille tuberculeux. I. Dénombrement et identification des constituants précipitant avec les immunsérums spécifiques. **[Immunochemical studies on soluble antigens and haptens of tubercle bacilli. I. Components precipitated by specific immune sera.]** —Ann. Inst. Pasteur **97,** 148-170. [English summary modified.] 333

By immuno-electrophoretic analysis the following components have been identified in culture filtrates and unheated autolysates of the human strain H37Rv :—

(a) Two polysaccharides, one identical with Seibert's polysaccharide I, the other obtained by hydrolysis of a lipopolysaccharide (which might be called polysaccharide III). A third component seems to be a polysaccharide and is perhaps identical with Seibert's polysaccharide II.

(b) Three (or four) proteins, one of them being Seibert's C protein. Proteolytic enzymes had very little activity on these proteins and they were not degraded by trichloracetic acid; all were thermolabile.

Culture filtrates of bovine strain 1099 contained less polysaccharide III than those of strain H37Rv; one of the proteins was either absent or present in very low concentration. Old Tuberculin contained only polysaccharides I and III.

All these substances were haptens, unable to induce the formation of antibodies, and seemed to be degradation products of more complex molecules.

Billaudelle, H. et al. (1959). **Studies on endotuberculin. II. Some biochemical properties of endotuberculin from human and bovine strains.** — Z. Immunforsch. **118,** 8-19. [In English. Summaries in French, German, Spanish and Russian.] 334

Endotuberculin is a complex of lipopolysaccharide and protein obtained from live tubercle bacilli by freezing at −56°C. and thawing at 40° twenty times. The authors studied gel electrophoresis, amino-acids and sugars of the preparation.—R.M.

Parlett, R. C. & Youmans, G. P. (1959). **An evaluation of the specificity and sensitivity of a gel double-diffusion test for tuberculosis. A double-blind study.** — Amer. Rev. respir. Dis. **80,** 153-166. [Summaries in French and Spanish. Authors' summary modified.] 335

A gel double-diffusion test was used on sera from 465 non-tuberculous persons, 456 of whom possessed no antibody to mycobacterial agents by this test. 166 of the 465 persons showed some degree of tuberculin hypersensitivity.

Of 1,097 sera from tuberculous patients, gel diffusion tests were positive in 320 of 380 cases of advanced active pulmonary TB. Of sera from 140 patients from whom only atypical acid-fast bacilli had been isolated, 104 contained mycobacterial antibody. With 78 sera from persons with either inactive or "cured" TB., 44 were positive. In 41 cases of extrapulmonary TB. 18 possessed circulating antibody.

Harding, H. P. (1959). **The histopathology of Mycobacterium johnei infection in small laboratory animals.**—J. Path. Bact. **78,** 157-169. [Author's summary modified.] 336

Histological lesions in mice, rabbits and hamsters infected with cultures of *M. johnei* were described. In general the lesions were similar in all species, but susceptibility of different organs varied. In mice the commonest lesions were in the liver parenchyma, while in rabbits and hamsters the portal tracts were more commonly involved. Pulmonary lesions were severe in rabbits; in hamsters and mice the changes were much less apparent. A condition comparable to the natural disease in ruminants was produced only in one mouse.

Ferraro, A. (1959). Osservazioni in merito all'ultimo episodio di morva verificatosi in provincia di Foggia. **[Comments on a case of glanders in Foggia, Italy.]**—Vet. ital. **10,** 633-643. [Summaries in English, French and German.] 337

The object of this paper is to draw attention to the value of temperature taking in conjunction with the mallein test for the diagnosis of glanders. Investigation of a case in 1956 revealed that the animal had come from the premises on which the last reported outbreak in the province of Foggi had occurred in 1953. Repeated intradermo-palpebral tests on the 17 horses on these premises revealed 4 reactors, which were destroyed. Of the remaining 13 which were re-tested, with temperature taking as an additional indicator, 12 reacted.—T.E.G.R.

Dacres, W. G. & Groth, A. H., Jr. (1959). **Identification of Erysipelothrix insidiosa with fluorescent antibody.** — J. Bact. **78,** 298-299. 338

*E. rhusiopathiae* was specifically stained by the globulin fraction of immune serum against swine erysipelas labelled with fluorescein isothiocyanate. Studies are now being made with sera from infected animals.

—M.G.G.

Terent'ev, F. A., Vasil'ev, K. M., Zamurii, I. R. & Kalugin, V. I. (1959). **[Production and use of dried immune serum against swine erysipelas.]**—Veterinariya, Moscow **36,** No. 6 pp. 24-26. [In Russian.] 339

Vacuum-dried immune serum against swine erysipelas, administered i/p, was as effective as the original serum in protecting mice against s/c infection with erysipelas bacilli.—M.G.G.

Murase, N., Suzuki, K., Isayama, Y. & Murata, M. (1959). **Studies on the typing of Erysipelothrix rhusiopathiae. III. Serological behaviours of the strains isolated from the body surface of marine fishes and their epizootiological significance in swine erysipelas.**—Jap. J. vet. Sci. **21,** 215-219. [In English. Summary in Japanese. Authors' summary modified.] 340

Organisms identified biologically as erysipelas bacilli were isolated from the body surfaces of a high proportion of dead fish through mouse inoculation, but none were isolated from live fish.

Serological behaviour of most fish strains was different from the pathogenic groups A and B. Accordingly they were of little significance in relation to swine erysipelas. It was pointed out that group B organisms were ob-

tained from the tonsils of a high proportion of apparently healthy pigs.

Smith, G. R. (1959). **Isolation of two types of Pasteurella haemolytica from sheep.**—Nature, Lond. **183**, 1132-1133. 341

Strains of pasteurella isolated from pneumonia and septicaemia in sheep could be divided into two types. T strains gave 2-mm. colonies on blood agar in 24 hours which had dark brown centres when viewed by transmitted light, whilst A strains were smaller and were lightish-grey by transmitted light. In smears in distilled water, T strains were arranged in a lace-like pattern, whilst A strains were evenly dispersed. After 2 days' incubation, T strains gave a positive reaction in trehalose fermentation medium, but A strains were still negative after 10 days. In arabinose fermentation medium, T strains were negative and A strains positive after 7 days' incubation. All strains from outbreaks of lamb septicaemia were T strains, whilst from sheep pneumonia, a mixture was isolated on 4 occasions and A strains alone in 20 instances.—A. Ackroyd.

Le Minor, L., Thome, M., Perreau, P. & Charié-Marsaines, C. (1959). Deux nouveaux sérotypes de Salmonella: S. millesi (40:1v:1,2) et S. tchad (35:b:–). **[Two new serotypes of salmonella from mesenteric lymph nodes of cattle.]**—Ann. Inst. Pasteur **97**, 406-407. [Summary in English.] 342

Bacteriological study of mesenteric lymph nodes from cattle slaughtered in the Chad territory of French Equatorial Africa revealed two new serotypes named *S. millesi* and *S. tchad*.—R.M.

Thamm, H. & Schreiter, M. (1959). Grenzen der serologischen Diagnose des Salmonellen-Schafaborts. **[Limitations of the agglutination test for salmonella abortion in ewes.]**—Mh. VetMed. **14**, 173-178. 343

The authors discussed difficulties arising from variations in technique and the interpretation of agglutinin titres. Only titres of 1 : 400 and above could be regarded as positive. Lower titres could occur in healthy sheep from uninfected flocks.—R.M.

Cockburn, W. C. & Vernon, E. (1959). **The examination of English egg products. A report of the Public Health Laboratory Service.**—Mon. Bull. Minist. Hlth Lab. Serv. **18**, 158-161. [Authors' summary modified.] 344

In a study of liquid and frozen egg from 25 packing stations over a year, the colony counts varied widely from station to station. Counts varied also with the season of the year. Faecal coli were isolated from 74% of samples, and salmonellae from 1·2%. In large-scale English frozen-egg plants 2·6% of 786 samples yielded salmonellae, while in imported frozen egg in 1955–56 7% yielded salmonellae. Egg products from small producers appeared to be less contaminated with salmonellae than products from large producers.

Ellemann, G. (1959). Undersøgelser af nedskudt måger med henblik på isolation af salmonellabakterier. **[Isolation of salmonella bacteria from gulls shot down over Copenhagen.]**—Nord. VetMed. **11**, 607-618. [In Danish. Summaries in English, French and German. English summary modified.] 345

Of 307 gulls shot at the city refuse dump and at the sewage plant 16 were infected in the intestine, liver or spleen with salmonella. 12 of the 16 were infected with *S. typhimurium*. The birds were mainly herring gulls and black-headed gulls. Young herring gulls appeared to be most susceptible to salmonellosis. *S. virchow* was isolated from the intestinal content of two birds, *S. newport* from one, and *S. paratyphi B* from another.

Kaeberle, M. L. & Phillips, T. N. (1959). **Fistula of the withers: A case report.**—Illinois Vet. **2**, 15-16. 346

Fistulous withers in 3 Shetland ponies was associated with *Brucella abortus* infection. The organism was isolated in pure culture from a lesion in one of the horses and all had positive agglutinin titres. 3 cattle on the same farm as the horses also reacted to the agglutination test. —R.M.

Castañeda, M. R., Flores Beltran, A. & Malaga Alba, A. (1959). Investigacion de la brucelosis bovina por la prueba de fijacion en superficie. **[The surface fixation test in bovine brucellosis.]** — Cienc. vet., Mexico **4**, 201-206. 347

When the test [*V.B.* **24**, 3753] was applied to sera of 6,000 cattle, 33% were positive and 67% negative. Agglutination tests of the same sera revealed 25% positive and 75% negative. —R.M.

Anczykowski, F. (1959). W sprawie standardyzacji barwioney zawiesiny Br. abortus do aglutynacji. I. Wybór szczepu. **[Standardization of stained brucella suspensions for the**

**agglutination test. I. Choice of strain.**] — Roczn. Nauk rol. Ser. E. **69**, 83-92. [In Polish. Summary in English.] 348

Of 82 strains of *Br. abortus* examined, Strain 19 was the most suitable for the production of standardized, stained suspension for the milk ring test and tube agglutination tests on milk, semen and blood serum.

The modification of Henry's method described by White & Wilson [*J. Bact.* **61**, 239] was most suitable for examining brucella strains.—M. GITTER.

Mingle, C. K. (1959). **Status of State-Federal cooperative brucellosis eradication.** — Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 73-82. 349

M. gives figures for the years 1951–58. 63 million cattle were dealt with. The percentage of reactors fluctuated between a maximum in 1952 of 4·2% and a minimum in 1958 of 1·6%; in the latter year nearly all reactors were slaughtered. Between 1955 and 1958, 21 million calves were vaccinated with *Br. abortus* Strain 19. In pigs and goats in the 7-year period 5% of 634,000 and 1·18% of 97,000 respectively tested by agglutination were positive or suspect; in 1958, 4·1% and 1·5%. The value of the ring test and the usefulness and limitations of Strain 19 vaccination are pointed out.—W. K. DUNSCOMBE.

Karsten, F. (1959). Stellungnahme zu den in Schleswig-Holstein vorgekommenen Fällen von seuchenhaftem Verkalben bei Kühen durch Erreger, welche die biochemischen und serologischen Eigenschaften der Brucella melitensis aufweisen. [**Abortion in cows in Schleswig-Holstein due to an organism having biochemical and serological characteristics of Brucella melitensis.**] — Dtsch. tierärztl. Wschr. **66**, 294-299. [Summary in English.] 350

K. in 1956 indicated the possibility that organisms with the characteristics of *Br. melitensis* would be found in cattle in Germany, and mentions the report by Börger which described such cases in 1958 [*V.B.* **28**, 3132]. K returns to his theory that all brucella strains stem from a simple prototype, *Br. melitensis*, and repudiates the large number of variants which have been described by many authors on the basis of biochemical differences. Many organisms which cannot be typed by the FAO/WHO key are present in Germany. The changes in type are probably due to passage in various animal hosts and the present differentiation into 3 types is not satisfactory. He emphasizes the danger of *Br. melitensis* infection in man and the risk of rapid passage from sheep to cattle.

All 3 forms should be controlled by slaughter of infected animals and the stamping-out of infection in farms. Goats are suitable experimental animals to determine whether a doubtful strain is *Br. melitensis* or not. K. considered that the organisms isolated in Schleswig-Holstein were probably *Br. abortus* after all.—W. K. DUNSCOMBE.

Golosov, I. M. & Zabrodin, V. A. (1959). [**Brucellosis in reindeer.**] — Veterinariya, Moscow **36**, No. 11 pp. 23-25. [In Russian.] 351

In the Taimyr peninsula each year 4–5% of reindeer were affected with bursitis of the carpus. Orchitis, epididymitis, abortion and infertility also occurred. Agglutination tests on 4,235 reindeer revealed reactors in 15%; 96 of the 4,235 had bursitis. Huddleson's plate technique was found suitable for agglutination tests in the tundra. 13 strains of brucella were isolated but none possessed all the properties of any one species.—R.M.

Hulse, E. C. (1959). **The production controls of living Brucella vaccines, with special reference to Strain 19 vaccine.**—Proc. IVth Int. Congr. Biol. Standardization, Brussels, 1958 pp. 227-235. [In English. Author's summary modified.] 352

The routine controls for the production of Strain 19 vaccine were described. These included tests for freedom from contamination and abnormal toxicity, bacterial dissociation, and safety and potency tests on laboratory animals. Routine testing of viability of liquid vaccine was described and a procedure for testing the freeze-dried product was suggested.

Zinneman, H. H., Glenchur, H. & Hall, W. H. (1959). **The nature of blocking antibodies in human brucellosis.** — J. Immunol. **83**, 206-212. [Authors' summary modified.] 353

Agglutinating antibodies were found in beta and gamma globulins of the sera of human beings with brucellosis. "Blocking" antibodies appeared later than agglutinating antibodies. They were seen first in gamma globulins but soon shifted to beta globulins. They persisted after the agglutinating antibodies subsided.

The blocking and prozone phenomena appeared to be related. The prozone pheno-

menon did not represent the effect of antibody excess.

Extraction with ether or incubation with *Salmonella typhi* failed to eliminate the blocking effect, but absorption with *Br. abortus* did. This suggested that the blocking substance in beta globulins was a specific antibody.

Prudentov, N. A. & Polkhovskii, F. Y. (1959). **[Influence of Strain 19 vaccine on sheep already positive to serological tests.]**—Veterinariya, Moscow **36,** No. 5 pp. 30-31. [In Russian.] **354**

335 ewes on an isolation farm for brucella reactors were examined by c.f. tests and intradermal allergic tests and a high proportion reacted to both tests. 163 were then inoculated with Strain 19 vaccine. These and the unvaccinated ewes were artificially inseminated 1–2 months later. The results of diagnostic tests 7½ and 11 months after vaccination and the number of normal lambings are given in a table. No vaccinated and only one unvaccinated ewe aborted. Normal lambings occurred in 100 of 107 vaccinated ewes and 96 of 110 unvaccinated. It was difficult to draw definite conclusions on the effect of vaccination on reactions to diagnostic tests.—R.M.

Renoux, G. (1959). Rapport final au gouvernement de la Tunisie sur les expériences sur la brucellose des ovins et des caprins. Essais de vaccins contre l'infection par Br. melitensis. **[Report to the government of Tunisia on vaccination of sheep and goats against brucellosis.]** pp. 39. Rome: Food & Agriculture Organization of United Nations. (FAO Report No. 1052.) **355**

R. summarizes several years' work on brucellosis of sheep and goats. The report is long and has 7 annexes. The main aim was to find a suitable vaccine. Many animals were used in the tests and all were slaughtered, examined P.M. and cultures made from various tissues, even a single brucella colony being taken as evidence of infection. The most suitable vaccine was made from a smooth strain of *Br. melitensis* 53 H 38, freeze-dried in a non-resorbable medium (5% polyvinylpyrrolidone "Subtosan" special) and formalin killed. This vaccine was stable, easily prepared, non-infective, cheap and more effective than 2 other vaccines tested.

Among other important items in the report are: (1) proof that new-born goats are highly susceptible to *Br. melitensis;* (2) the Coombs test is the most sensitive serological test for both sheep and goats; (3) for isolation from milk, culture of the centrifuged deposit is best; (4) virgin goats can excrete *Br. melitensis* in the normal vaginal secretion; (5) there is a great variation in the sensitivity of g.pigs to brucella, hence it is necessary to inoculate several with any suspected material, and these animals may harbour the organisms without positive agglutination.

In an annexe K. Meyer states that *Br. melitensis* has been isolated from the faeces of goats and he also suggests that as kids may harbour the organism for as long as 52 days, they may perpetuate the infection and that this might also apply to cattle and horses.

—W. K. Dunscombe.

Rementsova, M. M. (1959). **[Brucellosis in hares: isolation of Br. melitensis.]** — Veterinariya, Moscow **36,** No. 11 pp. 26-28. [In Russian.] **356**

In part of the Alma-Ata oblast where brucellosis occurred in sheep and goats, 321 hares were shot and strains of brucella were isolated from 5. The strains resembled *Br. melitensis* in their behaviour in the presence of fuchsin and thionine and in their inability to produce $H_2S$.—R.M.

Anczykowski, F., Murat, P. & Gryczowa, B. (1959). Bruceloza u drobiu. III. A. W sprawie współaglutynacji pałeczki Brucella i S. pullorum. **[Brucellosis in fowls. IIIa. Cross agglutination between brucella and Salmonella pullorum.]**—Roczn. Nauk rol. Ser. E. **69,** 93-106. [In Polish. Summary in English.] **357**

2,486 serum samples from 16 flocks from 4 districts in Poland were examined by tube agglutination test. There was no cross agglutination between brucella and *S. pullorum.*

—M. Gitter.

Claus, K. D., Newhall, J. H. & Mee, D. (1959). **Isolation of Pasteurella tularensis from foals.**—J. Bact. **78,** 294-295. **358**

In a group of mares and foals in a tick-infested area where tularaemia is endemic, 2 foals died and *Brucella tularensis* was recovered from the organs. Agglutinating antibody against the organism was demonstrated in most of the remaining animals, some of which developed an acute febrile disease. Two tick-infested horses in contact with a flock of sheep with tularaemia were serologically positive.

—M.G.G.

Inui, S., Iwata, A., Hirota, E. & Watanabe, M. (1959). **[Studies on bovine leptospirosis in Japan. III. Histopathological studies on leptospirosis associated with hemoglobinuria.]** —Bull. Nat. Inst. Anim. Hlth, Tokyo No. 37 pp. 71-84. [In Japanese. Abst. from English summary.] 359

Tissues from 9 cattle with haemoglobinuria were examined and *Leptospira hebdomadis* isolated from 5. The findings in all 9 were similar and they resembled those described for *L. pomona* infection of cattle in the U.S.A.—R.M.

Musaev, M. A. (1955). **[Histological changes in the central nervous system of cattle with leptospirosis.]**—Izv. Akad. Nauk Azerbaĭdzhan. SSR No. 5 pp. 11-26. [In Russian.] 360

Sections of thalamus, frontal lobe and hippocampus were prepared from 2 calves and a cow which died from icteric leptospirosis. One calf died after 5 days' illness, the other after 7 days, and the cow after 12 days. In the calves there were acute dystrophic changes in the brain with damage to the walls of blood vessels and commencing dystrophy of astrocytic glia. In the cow (subacute illness) changes were similar except for proliferative-dystrophic reaction of astrocytes and focal dystrophy of histiocytes. While there was diffuse dystrophy in the cerebral cortex, in the thalamus and hippocampus there were haemorrhages from blood vessels. There are twenty photomicrographs. [Although this work is now five years old, it has been abstracted because descriptions of nervous lesions in leptospirosis in animals are not readily available.]—R.M.

Kemenes, F. & Lovrekovich, L. (1959). Über den Fettabbau durch pathogene Leptospiren. **[Breakdown of fat by pathogenic leptospira.]** —Acta vet. Acad. Sci. hung. **9**, 235-241. [In German.] 361

Small glass plates, a little narrower than microscope slides, coated with a thin layer of sterile tallow or lard were placed in test tubes containing 4 or 6-day-old cultures of 34 strains of leptospira in Korthoff's medium. The tubes were examined after a week's incubation for dissolving of the fat layer, formation of oil droplets, presence of fatty acids and change in pH. The most virulent leptospires *(icterohaemorrhagiae, canicola* and *pomona)* were the most active in breaking down fat: this property may be responsible for their greater pathogenic action on animals. Old stock strains were unable to break down fat.—R.M.

Peterson, E. H., Hendrix, R. D. & Worden, C. E. (1959). **Low fertility in turkeys associated with vibriosis.** — J. Amer. vet. med. Ass. **135**, 219-223. [Authors' summary modified.] 362

Infertility in turkeys and poor hatchability of their eggs which could not be related to feeding practices, genetics, flock or hatchery management is described. Reproductive performance may be reduced 50% or more. Circumstantial evidence suggests that the problem is due to a uterine infection. In four affected flocks, an organism classified in the genus *Vibrio* was isolated from 10 to 80% of infertile eggs examined. The organism was regarded as the probable cause of infertility.

After oxytetracycline was incorporated in the mash fed to breeding birds at a concentration of 40 g. or more per ton, beginning at the onset of production and continuing throughout the breeding season, the disorder disappeared from affected areas.

Youatt, W. G., Fay, L. D., Whitehead, G. L. & Newman, J. P. (1959). **Brucellosis and leptospirosis in white-tailed deer in Michigan.**—J. Wildlife Mgmt **23**, 345-348. [Authors' summary modified.] 363

Plate-agglutination tests for brucellosis on 866 serum samples from deer were all negative at the 1 : 25 dilution. *Leptospira pomona* agglutination-lysis tests were made on 190 samples and positive titres were found in 50. There was no correlation as to location, sex, or age of the deer that showed positive titres. In addition, 40 of the 190 samples tested with *L. canicola* and *L. icterohaemorrhagiae* antigens were negative.

Raynaud, M., Turpin, A., Relyveld, E. H., Corvazier, R. & Girard, O. (1959). Préparation d'antitoxine antitétanique par immunisation des chevaux avec des anatoxines tétaniques de haute pureté. **[Preparation of tetanus antitoxin by immunization of horses with purified toxoid.]** — Ann. Inst. Pasteur **96**, 649-658. [Summary in English.] 364

Toxoid was purified by adsorption on calcium phosphate [see *Ann. Inst. Pasteur* **96**, 60]. Development of flocculating antibody was studied. As in the case of crude toxoid, serum from horses that had previously received tetanus antitoxin was more potent.—R.M.

Pemberton, P. L. (1959). **Non-contagious ovine posthitis ("sheath rot"): its treatment with cetrimide.** — Aust. vet. J. **35**, 359-365. 365

Cetrimide, ethyl alcohol and cupric sulphate gave good results in the treatment of the external form of ovine posthitis.

Combined treatment of 20% cetrimide in alcohol and i/m injection of 500,000 units of an aqueous suspension of procaine penicillin G cured 80% of over 100 wethers with severe chronic internal ulceration.

Clinical signs, course and method of treatment are described.—A. CULEY.

van Rees, A. L. A. & Sijbesma, W. (1959). Lymfangitis met necrose bij varkens. [**Lymphangitis with necrosis in pigs.**]—Tijdschr. Diergeneesk. **84,** 1175-1177. [In Dutch. Summary in English.] **366**

Lymphangitis with necrosis in the hams of 10 pigs was unilateral and might have been caused by an earlier intramuscular injection. (There was no evidence of what injections the pigs received.) According to regulations the hams should be condemned for human consumption.—R.M.

Dzhilavyan, K. A. (1957). [**Experimental stachybotryotoxicosis in pigs.**]—Bull. Informatsii Vsesoyuz. Inst. vet. Sanit. No. 2 pp. 60-61. [In Russian.] **367**

Spontaneous stachybotryotoxicosis has not yet been recorded in pigs, but continuous feeding of small amounts of oats contaminated with *Stachybotrys alternans* produced poisoning similar to that seen in horses. Young pigs received 20–30 g. contaminated oats daily until 1–1·5 kg. had been consumed and adults received 30–60 g. daily until about 2·5 kg. had been consumed. [On pages 52–53 of the same bulletin, D. described experimental poisoning of fowls with the same fungus.]—R.M.

Corsico, G. (1958). Sui reperti morfopatologici di una malattia delle mucose dei bovini successiva a mastite micotica da Candida. [**A disease of the mucous membranes in cows with Candida mastitis.**]—Atti Soc. ital. Sci. vet. **12,** 365-369. [Summaries in English and French.] **368**

Intramammary treatment with penicillin was given in a herd of 64 cows after the isolation of *Streptococcus agalactiae* from a herd milk sample. Acute mastitis developed 48 hours later in 29, with systemic disturbances in some, and *Candida* sp. was isolated from milk and mammary glands. A syndrome resembling mucosal disease later developed in some of the cows. Lesions and findings are described and discussed.—T.E.G.R.

Hasenclever, H. F. (1959). **Comparative pathogenicity of Candida albicans for mice and rabbits.**—J. Bact. **78,** 105-109. [Author's summary modified.] **369**

Female Swiss white mice are highly susceptible to i/v inoculation of *C. albicans.* They are as susceptible or more so to some strains than male albino rabbits. These conclusions are based on comparative weight for weight studies following the i/v inoculation of 10 strains of *C. albicans* in mice and rabbits. *C. tropicalis* showed some lethality for mice, but not for rabbits. *C. parapsilosis* and *C. stellatoideo* did not produce death in mice or rabbits. *C. guilliermondii, C. krusei,* and *C. pseudotropicalis* had no lethal effects on mice, and were not studied in rabbits.

Keep, J. M. (1959). **The epidemiology and control of Microsporum canis Bodin in a cat community.** — Aust. vet. J. **35,** 374-378. [Author's summary modified.] **370**

An experimental and two natural outbreaks of ringworm in cat colonies are described and the mechanism by which the infection may persist indefinitely, discussed. Control measures involve the regular use of filtered ultra-violet (Wood's) light on all animals, strict cleanliness and isolation of recovered and uninfected animals. Therapeutic treatment alone did not alter the course of the disease.

Kaplan, W. & Ajello, L. (1959). **Oral treatment of spontaneous ringworm in cats with griseofulvin.**—J. Amer. vet. med. Ass. **135,** 253-261. [Authors' summary modified.] **371**

Twenty-two cats with *Microsporum canis* ringworm were treated orally with griseofulvin. Of the 18 that had lesions 10 were clinically normal within three weeks, 6 at the end of one month, and 2 at the end of five weeks. 8 cats were rendered culturally negative through the use of this drug alone.

The toxicity of griseofulvin for cats appears to be low. Of the 22 cats, only 1 developed a possible side reaction (generalized pruritus) after three weeks of daily therapy which disappeared spontaneously in three days without interruption of treatment.

Griseofulvin appears to have many desirable properties for the control of ringworm in cats.

Pier, A. C. & Fossatti, M. J. (1959). **Nocardial mastitis. (A situation report of a newly recognized disease of American dairy cattle).** — Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 p. 161. **372**

The authors have never isolated *Nocardia asteroides* from an udder without signs of detectable mastitis. The principal method of infection is faulty technique in making udder infusion for mastitis. The extent of the infection in California is being investigated.
—W. K. DUNSCOMBE.

Vallée, A., Piéchaud, M., Destombes, P. & Second, L. (1959). Enzootie d'adénites suppurées chez le rat blanc provoquée par un actinobacille. **[Endemic suppurative adenitis associated with an actinobacillus in albino rats.]**—Ann. Inst. Pasteur **97**, 346-352. [Summary in English.] 373

Suppurative adenitis of cervical lymph nodes appeared in a stock of albino rats. From the pus the authors isolated an organism related to *Actinobacillus lignieresi*. Infection was experimentally induced in albino rats by oral administration of non-diluted pus.—R.M.

Mulcock, A. P. (1959). **Discoloration of wool fibres by a fungus.**—Nature, Lond. **183**, 1281-1282. 374

Black discoloration which would not be removed by ordinary wool scouring was caused by a species of *Peyronellaea* not previously recovered from wool.—R.M.

Bryant, M. P. (1959). **Bacterial species of the rumen.**—Bact. Rev. **23**, 125-153. 375

A review of species isolated and their biochemical properties, with notes on the culture of rumen bacteria, and 132 references.

Gutierrez, J., Davis, R. E. & Lindahl, I. L. (1959). **Characteristics of saponin-utilizing bacteria from the rumen of cattle.** — Appl. Microbiol. **7**, 304-308. 376

Two groups of Gram-negative bacteria which degraded saponin resembled *Butyrivibrio fibrisolvens* and *Bacteroides ruminicola*. Significant amounts of slime were produced from saponin breakdown by both genera. Production of slime might be concerned in the pathogenesis of frothy bloat in cattle.—R.M.

Allison, M. J., Bryant, M. P. & Doetsch, R. N. (1959). **Conversion of isovalerate to leucine by Ruminococcus flavefaciens.** — Arch. Biochem. **84**, 245-247. 377

The rumen contains little free amino-acids but relatively abundant ammonia and volatile fatty acids. The authors suggested that this environment selected some bacteria which utilized isovalerate and ammonia for leucine synthesis. *R. flavefaciens* preferred to synthesize its own amino-acids rather than use preformed acids.—R.M.

Seamer, J. (1959). **Eperythrozoon and Haemobartonella.**—Vet. Rec. **71**, 437-438. 378

Species of *Eperythrozoon* and *Haemobartonella* have been recorded as blood parasites of cattle, pigs, cats, rats and mice, but not of horses or poultry. Most species except those of rodents are host specific and only *E. coccoides* has been cultivated in embryonated eggs. Infection is by injection or ingestion of infected blood, and lice are known vectors of some species. Although generally non-pathogenic, *E. suis* is responsible for icteroanaemia of pigs in the U.S.A. and *H. felis* for feline infectious anaemia, while *E. ovis* has been reported to cause haemolytic anaemia in sheep in South Africa. In combination with a hepatitis virus or bacterial endotoxin *E. coccoides* has produced severe disease in mice. The organisms are sensitive to organic arsenicals, the tetracycline antibiotics and organic antimonial preparations. Complement-fixing antibodies have been demonstrated against *H. muris*, *E. coccoides* and *E. suis*.—A. ACKROYD.

*See also absts.* **576** (bacteriology of the cow's uterus); **599** (book on bacterial physiology).

## DISEASES CAUSED BY PROTOZOAN PARASITES

Hoare, C. A. (1959). **Amoebic infections in animals.**—Vet. Rev. Annot. **5**, 91-102. 379

A review of 23 species belonging to the genera *Entamoeba*, *Iodamoeba* and *Endolimax* that are pathogens or commensals in domestic and laboratory mammals, monkeys and poultry, with 4 plates of illustrations. H. discussed amoebiasis in cattle, dogs and rats, and the relationship of human and porcine strains. He concluded that there was definite evidence that *Entamoeba histolytica* infection occurred in animals.—R.M.

I. Heisch, R. B., McMahon, J. P. & Manson-Bahr, P. E. C. (1958). **The isolation of Trypanosoma rhodesiense from a bushbuck.** — Brit. med. J. November 15th, 1203-1204. 380

II. Duke, H. L. (1958). **Trypanosoma rho-**

**desiense in bushbuck.**—Ibid. December 6th, 1410-1411. 381

III. Ashcroft, M. T. (1959). **Trypanosoma rhodesiense in bushbuck.** — Ibid. January 17th, 173-174. 382

IV. Duke, H. L. (1959). **Trypanosoma rhodesiense in bushbuck.** — Ibid. March 14th, 720-721. 383

I. Ashcroft had previously concluded that there was no direct proof of the presence of *T. rhodesiense* in wild animals [*V.B.* **28,** 3542]. The present authors shot 10 bushbuck, 13 duikers and 1 serval cat and inoculated blood from these animals into rats: three strains of polymorphic trypanosomes and also *T. congolense* were isolated. One polymorphic strain from a bushbuck was infective to man. The authors believed this strain to be *T. rhodesiense* and stated that this was the first time it had been isolated from animals. The volume of blood injected into mammals to test infectivity should be large (30 ml.).

II. Duke recalled that in 1919 Taute & Huber had failed to infect 129 Africans with *T. brucei,* and that previous attempts had been made to isolate polymorphic trypanosomes from game animals. He had recovered such a strain from a bushbuck and had infected man with the organism.

III. Ashcroft defended his previous conclusions and considered that volume of inocula had no bearing on the results of his tests. The polymorphic trypanosomes were very similar, but infectivity for man was a stable property of *T. rhodesiense.*

IV. Duke continued his discussion and recommended Hoare's suggestion [*V.B.* **15,** 952] that *T. brucei, gambiense* and *rhodesiense* should be regarded as biological races of a polymorphic species, one of whose potential hosts is man, their distinguishing features being determined by their environment in nature.—W.A.P.

Ashcroft, M. T. (1959). **The effect of cortisone on Trypanosoma rhodesiense infections of albino rats.**—J. infect. Dis. **104,** 130-137. 384

Daily s/c injection of cortisone acetate, starting one day before injecting rats with *T. rhodesiense,* produced higher parasitic counts than in controls; probably because of inhibition of the host's defence mechanism by the drug. 25 and 50 mg./kg. produced early enhancement of parasitaemia followed by its inhibition; 5 mg./kg. produced enhancement only. The treated animals apparently developed greater tolerance to the increased parasitaemia than the controls.

Daily administration of the drug from 7 days before to 7 days after or from 15 days after infection produced lower parasitaemia in rats than in controls.—B. M. Wilson.

Jaroslow, B. N. (1959). **The effects of X or neutron irradiation, India ink blockade, or splenectomy on innate immunity against Trypanosoma duttoni in mice.**—J. infect. Dis. **104,** 119-129. 385

Different doses of X-rays administered to mice one day before infection with *T. duttoni* produced very high parasitaemia and increased reproductive activity of the parasites. The latter was independent of the X-ray dose. The level of reproductive activity was twice as high using neutron irradiation in place of X-rays.

Indian ink blockade of the lymphoid macrophage system increased the reproductive activity of the parasites but had no effect on parasitaemia. Blockade combined with X-ray had an additive effect.

It is concluded that the reproductive activity of the parasite is associated with the state of the host's lymphoid-macrophage system; radiation probably reducing phagocytosis. The spleen alone did not control reproductive activity. The trypanocidal effect of radiation depends on the degree of total body injurv to the host.

Irradiation of rats infected with *T. lewisi* produced gradual increase in parasitaemia but no change in parasitic reproductive activity.

—B. M. Wilson.

Farr, M. M. (1959). **Survival of Histomonas meleagridis and eggs of five species of turkey nematodes outdoors on soil.**—J. Parasit. **45,** No. 4 Sect. 2 p. 41. 386

Eggs of *Heterakis gallinae* remained infective up to 230 weeks, of *Ascaridia* spp. up to 161 weeks, of *Capillaria obsignata* up to 102 weeks, and of *Syngamus trachea* up to 31 weeks. Droppings from infected fowls or turkeys placed on soil reproduced blackhead when fed to poults after 151 weeks. Since the unprotected blackhead organism dies within a few hours outside the avian host, it must be assumed that it was incorporated within the *Heterakis* egg.—R.M.

Scholtyseck, E. (1959). Zur Pathologie der Eimeria-maxima-Coccidiose. **[Pathology of Eimeria maxima infection in fowls.]**—Zbl. Bakt. I. (Orig.) **175,** 305-317. [Summaries in English, French, Spanish and Russian.] 387

While investigating coccidiosis associated with 4 species of *Eimeria,* S. found four young fowls that were excreting in the faeces almost exclusively *E. maxima.* These birds provided material for studying the life-cycle and pathogenicity of this species in 213 pullets. The two schizogony cycles did not appear to harm the host; damage to the intestine occurred during sporogony.—R.M.

Lotze, J. C. (1959). **The effect of experimental infections of the coccidium Eimeria faurei on wool.**—J. Parasit. **45,** No. 4 Sect. 2 p. 40. [Author's abst. modified.] 388

Lambs aged 3 months reared free from parasites were given single inoculations of 1, 5, 10, or 50 million sporulated oocysts. Breaks in the wool took place in a period of 7 to 11 days commencing 42 to 44 days after inoculation; there was no evidence of wool-break in another lamb inoculated with 20 million sporulated oocysts. Wool-break was most extensive in lambs inoculated with either 1 or 50 million oocysts, and least extensive in the one which had been inoculated with 10 million oocysts. Coccidia as well as helminth parasites should be considered as possible causes of inferior wool fibres.

Kotlán, A., Versényi, L. & Janisch, M. (1959). Über das Vorkommen von Piroplasma bigeminum in Ungarn. **[Occurrence of Babesia bigemina in Hungary.]**—Acta vet. Acad. Sci. hung. **9,** 131-133. [In German.] 389

It had previously been assumed that *B. bovis* was the sole cause of piroplasmosis in cattle in Hungary. Closer study of the disease and the parasites revealed *B. divergens* and *B. bigemina.* There are two coloured plates showing infected erythrocytes.—R.M.

Jezierski, A., Lambelin, G. & Lateur, L. (1959). Immunisation des bovidés contre l'East Coast Fever (E.C.F.) (Theilériose à Theileria parva). **[Immunization of cattle against East Coast fever.]**—Bull. Inst. Agronom. Congo belge **8,** 1-21. 390

Following the report of Neitz [*V.B.* **23,** 1212] observations on the immunisation of cattle against E.C.F. have been made with the object of protecting valuable breeding bulls. Parasitaemia is induced by the use of infected ticks and the disease controlled by not less than 16 injections of chlortetracycline given i/v at intervals not exceeding 48 hours, starting not later than 24 hours after infection, when the thermal reaction reaches a maximum. Details of the various techniques employed are given. A local strain of the parasite seemed to give a better protection than one obtained from S. Africa.—S. Brian Kendall.

Christensen, J. F., Osebold, J. W. & Rosen, M. N. (1959). **The incidence of latent Anaplasma marginale infection in wild deer in an area where anaplasmosis is enzootic in cattle.** — Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 59-65. 391

In California deer are carriers of *A. marginale.* Blood from 18 deer (aged 8 months to 6 years) was inoculated into 18 splenectomized calves. In addition to tests for anaplasma, c.f. tests were also performed. 12 calves became infected, anaplasms being first detected on the 14th day, and the max. positive c.f. titre was 1 :1,280 (minimum positive being 1 :160). None of the deer had a c.f. titre higher than 1 :5. Transmission seemed to be independent of the age of the deer. The disease cannot be cleared by dealing with cattle alone; search for a suitable immunizing agent is suggested.
—W. K. Dunscombe.

Beverley, J. K. A. (1959). **Congenital transmission of toxoplasmosis through successive generations of mice.** — Nature, Lond. **183,** 1348-1349. 392

Toxoplasmosis has been transmitted experimentally to 5 successive generations of mice. In 30 out of 33 offspring of 8 mice, previously inoculated with 30 to 600 cysts of a strain of *Toxoplasma* of low virulence, an average of half of each litter was infected. Transfer usually occurs before birth, rarely by milk, and is not effected by droplet, faeces or urine nor by coitus.—B. M. Wilson.

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

van Bekkum, J. G., Frenkel, H. S., Frederiks, H. H. J. & Frenkel, S. (1959). **Observations on the carrier state of cattle exposed to foot-and-mouth disease virus.** — Tijdschr. Diergeneesk. **84,** 1159-1164. [In English. Summaries in French, German, and Dutch. Authors' summary modified.] 393

Convalescent cattle may harbour the virus in the saliva for months. The virus may be demonstrated in saliva by inoculation into un-

weaned mice or susceptible cattle. After contact with clinical cases vaccinated animals may become carriers without showing symptoms.

Susceptible cattle in contact with carriers remained unaffected. No cases of F. & M. disease occurred when vaccinated or unvaccinated cattle or unvaccinated pigs were introduced into a herd known to contain carriers. It was concluded that in cattle carrying F. & M. disease virus a continual formation of small quantities of infective material occurs. Purely mechanical carrying seemed highly improbable.

Schwöbel, W. & Traub, E. (1959). Erfahrungen bei der Züchtung von Maul-und-Klauenseuche-Virus in Schweine-Nierenzellen unter besonderer Berücksichtigung der Gefrierfähigkeit des Kulturvirus. **[Cultivation of foot and mouth disease virus in pig kidney cells, with reference to survival of virus in frozen culture fluid.]**—Mh. Tierheilk. **11,** 13-20. 394

Experiments were carried out with the O2 "Brescia" strain of F. & M. disease virus grown on trysinized pig kidney cells, first using Ringer-Locke solution with the detergent "Tris" added. This was found to be unsatisfactory and the Tris was replaced by $NaHCO_3$ when the culture showed no loss of infectivity even when frozen at – 55° to – 60°C. for 350 days. The influence of 5–20% saccharose and 0·01M glycocol either alone or in combination was also tested. Saccharose caused a slight increase in titre but glycocol seemed to have no action. $CHCl_3$ purification caused no significant reduction in titre. A chloroform purified 4–20% aphthae-extract $NaHCO_3$ buffered culture was inactivated by 1 : 2,000 formol, but if 5% inactivated pig serum was added 1 : 1,000 formol was necessary, and the authors consider that dilution is required for vaccines. The formation of c.f. antibodies was weak and irregular but calves formed more antibodies than pigs. They conclude that the virus multiplies very well in trypsinized calf kidney cells. Resistance to freezing is all-important, and a suitable buffer essential; $NaHCO_3$ is best and the addition of saccharose is unnecessary. Chloroform purification is better than Seitz filtration because virus is not lost and some of the non-specific protein is removed.

—W. K. Dunscombe.

Geiger, W. (1959). Die Entwicklung der Vakzination gegen Maul- und Klauenseuche in Deutschland. **[Development of foot and mouth disease vaccination in Germany.]** — Dtsch. tierärztl. Wschr. **66,** 8-10. [Summary in English.] 395

G. described the present F. & M. disease vaccines and the epidemiology of the disease in the German Federal Republic. All 3 types (with variants) are present, and a trivalent O, A & C vaccine was first prepared in 1951; in 1958 it formed 96% of all vaccine used. Between August 1956 and Feb. 1957 in Lower Saxony nearly 1½ million cattle were vaccinated, mostly with trivalent vaccine, and only 3 post-vaccine outbreaks occurred. Pyl's concentrated trivalent vaccine in 5-ml. doses was very satisfactory and is now used in nearly all cases. G. suggests that in Germany the stage is now being reached when prophylactic vaccination of all cattle can be carried out.

—W. K. Dunscombe.

Geiger, W. & Garbe, H. G. (1959). Die aktive Immunisierung von Saugkälbern gegen MKS mit Adsorbat-Vakzine. **[Active immunization of unweaned calves against foot and mouth disease with adsorbed vaccine.]**—Tierärztl. Umsch. **14,** 4-6. 396

The high sensitivity of new-born calves to all 3 types of the virus is due to lack of γ-globulin. Twenty-eight calves and 5 controls were vaccinated s/c with 20 ml. monovalent-O vaccine. The vaccinated and controls were kept together for 14–20 days, when the vaccinated were isolated. All were infected on the tongue with type O. A week later they were slaughtered and examined. Results: 5 of the 27 (one vaccinated calf had died) had a fatal *Salmonella enteritidis* infection and 17 others showed pneumonia or pleuritis. 6 only had generalized F. & M. infection, 2 local infection, and 5 others showed local aphthous infection with negative c.f. tests for F. & M. disease. 4 controls had generalized infection. The majority of those with generalized infection were vaccinated in the 1st week of life.

The authors consider that 52% were completely immune; the high infection rate in the 1st week is ascribed to lack of colostral γ-globulin while the one control which did not become infected had ingested colostrum. They conclude that 20 ml. is not a sufficient dose and recommend 30 ml. of normal or 5 ml. of concentrated vaccine.—W. K. Dunscombe.

Olechnowitz, A. F. (1959). Untersuchungen über die Abhängigkeit der Wirksamkeit von Adsorbatvakzinen gegen Maul- und Klauenseuche von den Eigenschaften des Aluminiumhydroxyds. I. Mitteilung: Herstellung und

Kennzeichnung von Aluminiumhydroxyden. [**Dependence of the efficacy of adsorbed foot and mouth disease vaccine on the properties of aluminium hydroxide. I.**] — Arch. exp. VetMed. **13**, 345-357. 397

Efficacy of adsorbed vaccine is largely dependent upon the method of preparation and the pH of aluminium hydroxide gel. Crystal growth and storage also have an influence. Properties of the precipitate can be studied by adsorption of Congo Red or casein. The isoelectric point of the vaccine is slightly on the acid side of neutrality.—F. R. PAULSEN.

Traub, E. & Schwöbel, W. (1959). Versuche zur Ergründung des mangelhaften Immunisierungsvermögens von Maul-und-Klauenseuche-Vakzinen bei Schweinen. [**Reasons for the poor immunity resulting from inoculation of foot and mouth disease vaccines in pigs.**]—Mh. Tierheilk. **11**, 1-13. 398

The problem of the vaccination of pigs against F. & M. disease is still unsolved. The authors investigated why a formolized adsorbate vaccine was not satisfactory, and compared the action of tissue culture vaccines with those from cattle or pig lesions, using the O2 "Brescia" strains, on "improved Landrace" pigs from clean areas. Bivalent O2-A5 vaccines marketed by Bayer (unconcentrated) and Behring (concentrated) were not satisfactory when tested, even in 10-ml. doses. A vaccine killed with either 1 : 1,000 or 1 : 2,000 formol was not satisfactory, even with 2 injections, 6 cultured (pig-kidney) viruses and 4 "natural" cattle viruses when tested on mice and pigs gave better protection to the mice.

The authors consider that the lack of response to a formolized aluminium hydroxide adsorbate vaccine can be explained only by a change in the antigenic structure of the virus resulting from chemical combination with the formaldehyde. Further experiments are to be made to see whether a reduction in the formol content with a longer retention period will give better results.—W. K. DUNSCOMBE.

Chevrier, L. (1959). Epidémiologie de la rage au Maroc. [**Epidemiology of rabies in Morocco.**]—Rev. Élev. **12**, 115-120. [Summaries in English and Spanish.] 399

During eight years (1951–58) rabies was diagnosed in 1,766 dogs, 132 cats, 212 cattle, 47 horses, 9 sheep or goats, 14 camels and a ferret. Although each year between 7,000 and 15,000 dogs were vaccinated, nine-tenths of the dog population were half-wild strays. There were twice as many human cases in 1957 and 1958 as in 1942 and 1943. This was partly explained by increases in the human population and the number of dogs.—R.M.

Sureau, P., Lemaitre, Y. & Rakotomanga, J. C. (1959). Premier cas de rage observé à Madagascar chez un chien préventivement vacciné avec le vaccin avianisé "souche Flury". [**Rabies in a dog inoculated with Flury vaccine.**]—Bull. Soc. Pat. exot. **52**, 15-19. 400

In a district with endemic rabies, a dog inoculated with freeze-dried Flury vaccine developed the furious form 11 months later. The diagnosis was confirmed by the demonstration of Negri bodies and the inoculation of mice with suspensions of medulla and salivary glands.—M.G.G.

I. Isaacs, A. & Westwood, M. A. (1959). **Inhibition by interferon of the growth of vaccinia virus in the rabbit skin.**—Lancet September 12th, 324-325. 401

II. Porterfield, J. S. (1959). **A simple plaque inhibition test for antiviral agents: application to assay of interferon.**—Ibid. 326-327. [Authors' summaries modified.] 402

I. Interferon prepared in rabbit kidney cells protected rabbits against i/d infection with vaccinia virus. Protection was complete when the interferon was given the day before large doses of virus. With smaller doses of virus, protection was obtained when interferon was given before or with the virus. When tested in the rabbit skin, interferon prepared in chick cells was much less effective than interferon prepared in rabbit cells; when the same preparations were tested in chick cells the converse was found.

II. The effect of interferon was demonstrated by inhibition of virus multiplication in a sheet of cells infected with a plaque-producing virus. The area of the zone of inhibition was directly proportional to the concentration of interferon applied. Hence the technique may be used as a means of assay.

Cilli, V. & Baldelli, B. (1959). Le comportement du virus de la clavelée dans les cellules testiculaires de Ovis aries cultivées in vitro. [**Behaviour of sheep pox virus in tissue cultures of sheep testicle cells.**]—Proc. XVIth Int. vet. Congr., Madrid **2**, 445-446. [In French.] 403

In tissue culture in ovine testicular cells the virus had a cytopathic effect even at the 5th

passage; by the 10th passage it was still capable of causing specific skin lesions in sheep while sheep pox immune serum neutralized the cultured virus and its cytopathic effect. On culture 3 different phases were found: (a) 0–60 hours; an initial fall in titre for 2 hours, this lower level being sustained till the 60th hour; (b) 60–96 hours progressive increase; (c) 96–168 hours; a gradual fall to reach at 168 hours the level found 2 hours after sowing. The highest conc. of virus was found when the cytopathic effect was demonstrable in most but not all of the cells. In stained specimens, cells with cytoplasmic inclusions were found during the period of multiplication before the virus had become infective; cells with nuclear vacuoles were associated with the exponential increase of virus; necrotic cells occurred when the virus in the culture fluid gradually became inactivated. [See also *V.B.* **29,** 1055.]

—W. K. Dunscombe.

Bamberger, K. & Szakmáry, G. (1959). **A comparative study of various fowl pox vaccines and methods of vaccination in turkey.** — Acta vet. Acad. Sci. hung. **9,** 39-42. [In English.] **404**

The number of turkeys involved is not clearly stated, though a number of flocks are mentioned. Methods of vaccine preparation are given and results tabulated. The following conclusions are reached: immunity produced is better by inoculation of live virus than by inactivated vaccine, and a greater quantity of this is more effective than a smaller.

Satisfactory results were obtained by inoculation with a live virus vaccine in a dilution of 1 : 20 using the wing-web stick method or the feather follicle method.

—Irene M. Dixon.

Traub, E. & Schwöbel, W. (1959). Über die Immunität der weissen Maus gegenüber dem EEE-Virus. III. Mitteilung. Versuche zum Nachweis von aktiven Virus bzw. Virusantigen in den Organen immuner Mäuse. **[Immunity to Eastern equine encephalomyelitis virus in mice. III. Active virus or viral antigen in organs.]**—Z. Immunforsch. **118,** 86-102. [Summaries in English, French, Spanish and Russian.] **405**

Large groups of mice actively immunized in different ways with virulent EEE virus were observed for long periods, mostly until they died naturally. Delayed encephalitis did not occur. Attempts to detect infectious virus or viral antigen in organs failed.—R.M.

Hardy, F. M. (1959). **The growth of Venezuelan equine encephalomyelitis virus in various tissue cultures.**—Amer. J. Hyg. **70,** 21-27. [Author's summary modified.] **406**

Eight different cell cultures from several host species were investigated for susceptibility to the virus and all supported virus multiplication. Growth patterns and peak titres were similar in all the cultures, but one cell line (Chang's human conjunctiva) required a much higher dose than others to initiate virus growth. Development of cytopathic effect depended on size of the virus inoculum and type of cell.

Dawson, F. W., Hearn, H. J. & Hoffman, R. K. (1959). **Virucidal activity of beta-propiolactone vapor. I. Effect on Venezuelan equine encephalomyelitis virus.** — Appl. Microbiol. **7,** 199-201. **407**

Beta-propiolactone vapour rapidly and effectively disinfected rooms contaminated with the virus and was in some ways better than formaldehyde. A concentration of 2–4 mg. per litre of air killed the virus after 15 min.—R.M.

Miura, S., Sato, G. & Miyamae, T. (1959). **On a hitherto unreported phenomenon suggesting possibility of multiplication of equine infectious anemia virus in lamb body.**—Jap. J. vet. Res. **7,** 15-20. [In English.] **408**

Following subcutaneous injection into Merino lambs of serum from horses with acute equine infectious anaemia, fever developed in several and their blood was capable of infecting horses with the disease. Infectivity coincided with the fever and was not correlated with the precipitation titre to equine serum components. Histological changes suggestive of equine infectious anaemia were observed in one lamb.

—A. Ackroyd.

Rokutanda, T., Ichihara, T., Watanabe, S., Eto, M. & Yamada, S. (1959). **[Tissue culture of equine infectious anemia virus.]**—J. Jap. vet. med. Ass. **12,** 263-267. [In Japanese. Summary in English.] **409**

Cultures of spleen, kidney, heart, liver, lung and inner coat of the aorta from horse foetuses were prepared. A strain of the virus was transferred to fresh culture every 7 days. After 5 transfers the culture fluid produced fever and anaemia in a colt, after 8 transfers the fluid had no effect on colts. The virus appeared to cause no changes in cultured cells until after 44–61 days of cultivation.—R.M.

Kawakami, Y., Kaji, T., Sugimura, K., Shimizu, T. & Matumoto, M. (1959). **A**

**preliminary survey for equine abortion virus infection by complement fixation test in Hokkaido, Japan.**—Jap. J. exp. Med. **29,** 203-211. [In English. Authors' summary modified.] **410**

Bacteriological examinations between 1953 and 1955 resulted in isolation of *Salmonella abortus-equi* from only 22% of 329 aborted foetuses. This suggested that a large proportion of abortions was not associated with salmonella infection. 1,206 sera were tested for equine virus abortion by the complement-fixation test. The incidence of antibodies in titres of 1 : 4 or greater was 46% in mares which aborted and 32% in normal horses. Positive reactors were found among horses practically everywhere in Hokkaido, although the incidence varied considerably. No correlation was noted between the agglutinating titre for salmonella and the c.f. titre for virus abortion.

Plowright, W. & Ferris, R. D. (1959). **Studies with rinderpest virus in tissue culture. I. Growth and cytopathogenicity.** — J. comp. Path. **69,** 152-172. **411**

This deals mostly with work on monolayer bovine kidney cells (Bodian's method), the virus being a virulent bovine-passaged strain which had been maintained for more than 40 years. Cytopathic effects were seen between 18 and 48 hours after infection, with complete destruction in 10–14 days. One "orphan" virus was recovered from one out of 100 lots of uninoculated kidney cells. Maximum titre was obtained between 6 and 10 days.

Host cells used included sheep testis, and sheep, goat, pig, rabbit, and hamster kidney cells. Goat-adapted, and lapinized virus failed to grow in monolayer cultures. Cytopathic action closely resembled that of measles virus. Syncytial formation without evident damage seemed to be associated with a longer production of virus. Many adult human sera have anti-rinderpest antibodies even up to 1 : 256 dilution. There are some excellent photomicrographs.—W. K. Dunscombe.

Enright, J. B., Sadler, W. W. & Robinson, E. A. (1959). **Sporadic bovine encephalomyelitis in California.** — Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 127-135. **412**

The disease is due to a virus related to the psittacosis-lymphogranuloma group. The disease usually affects calves, is generally mild with a number of inapparent infections; the method of transmission is unknown but close contact with an infected animal is necessary; abortion in late pregnancy may occur. The histology of the lesions is described. A human case possibly due to the virus of sporadic bovine encephalomyelitis is reported (the c.f. test was positive). An arthropod is possibly the vector.

—W. K. Dunscombe.

Johnston, K. G. (1959). **The virus diarrhoeas of cattle and similar diseases.**—Aust. vet. J. **35,** 101-110. **413**

Brief literature reviews are given of rinderpest, virus diarrhoea (New York and Indiana), mucosal disease (Iowa), infectious ulcerative stomatitis and winter dysentery, followed by an account of conditions occurring in Australia which have clinical similarities with the mucosal disease complex–ulcerative glossitis, an erosive stomatitis and epizootic diarrhoea. Epizootic diarrhoea was recognized in Australia for the first time in 1958, and its occurrence may have been associated with the importation of overseas grain. The mucosal diseases are intrinsically important, and might complicate the diagnosis of rinderpest should that disease appear again in Australia.

—N. Wickham.

Prat, J. (1959). Contribution à l'étude étiologique des avortements infectieux, dans l'espèce bovine. (Avortements à virus du groupe néo-rickettsien). **[Aetiological study of infectious abortion in cattle caused by viruses of the psittacosis-lymphogranuloma group.]** — Rev. Méd. vét. **110,** 453-460. [Summaries in English and Spanish.] **414**

Ten cows aborted which were serologically positive for strains of the psittacosis-lymphogranuloma group of viruses. Two cows were also positive for *Brucella abortus,* and in one herd abortions appeared to be due to two separate causes, brucellosis and virus infection. Two virus strains were isolated.—M.G.G.

McKercher, D. G., Saito, J. K., Wada, E. M. & Straub, O. (1959). **Current status of the newer virus diseases of cattle.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 136-158. **415**

Diseases recently identified in the U.S.A. include infectious rhinotracheitis, catarrhal vaginitis [*V.B.* **26,** 2603] and coital vesicular exanthema (infectious pustular vulvovaginitis) [*V.B.* **29,** 1066]. A virus isolated from catarrhal vaginitis was antigenically distinct from that isolated in South Africa from a

similar condition [*V.B.* **25,** 2394]. Most of the paper deals with development of a vaccine against infectious rhinotracheitis. The virus of rhinotracheitis could be transmitted to goats. Recovered cattle could act as carriers for a long time. A virus differing from that of rhinotracheitis was isolated from cattle with "shipping fever" by inoculation of cultured kidney cells with nasal washings or blood. Mild infection was produced in 1 of 2 calves inoculated with the virus but attempts to reproduce "shipping fever" in calves or cows were unsuccessful.—W. K. Dunscombe.

Stamp, J. T., Brotherston, J. G., Zlotnik, I., Mackay, J. M. K. & Smith, W. (1959). **Further studies on scrapie.**—J. comp. Path. **69,** 268-280. [Authors' conclusions modified.] **416**

The causal agent of scrapie disease was transmitted from the brain, spleen, lymph node and cerebrospinal fluid of sheep with scrapie.

The agent was not recovered from the brain of normal sheep. It was recovered from natural cases of the disease but not from offspring of affected sheep. It was not transmitted by ingestion.

The agent was recovered from sheep after a series of blind passages. Some of its characteristics are described, the most striking being that it withstood boiling for 8 hours.

Dickinson, L. & Cooper, B. S. (1959). **Contagious conjunctivo-keratitis of sheep.** — J. Path. Bact. **78,** 257-266. [Authors' summary modified.] **417**

An outbreak of contagious conjunctivo-keratitis of sheep in England was investigated. After infection large initial bodies were seen in impression smears of conjunctiva, followed by inclusions of elementary bodies; many polymorphs were present. All these structures disappeared after clinical recovery and reappeared during relapses, which were frequent. Similarities to structures occurring in human trachoma were discussed.

Chlortetracycline therapy was effective but chloramphenicol was not. Relapses after chlortetracycline treatment were frequent.

Other structures found in smears included a coccus, probably *Neisseria catarrhalis,* which was often recovered from normal and infected eyes but played no part in the disease. Very pleomorphic structures named "lumpy bodies" were often seen in smears from clinically normal eyes. They were produced in large numbers in 3 sheep by instillation of the causal agent in yolk-sac suspensions, but the eyes remained clinically normal and could later be infected by contact with an infected sheep. During the acute infection of these sheep no "lumpy bodies" were found in smears, but they reappeared when the eyes had recovered. After treatment with ethidium and pentamidine "lumpy bodies" disappeared.

Giroud, P. & Dumas, N. (1959). Le virus de l'avortement des ovins, son contrôle sur lapin. Action des antigènes formolés. [**Action of ovine abortion virus and formolized antigen on rabbits.**]—C. R. Acad. Sci., Paris **249,** 978-979. **418**

Intradermal inoculation of rabbits with the virus cultured in embryonated eggs resulted in fever and a reaction at the site of inoculation. A pregnant rabbit aborted. Intravenous inoculation caused myocarditis. All these effects were suppressed or were weaker in rabbits previously inoculated with formolized virus.—R.M.

Stefański, W., Majdan, S. & Wertejuk, M. (1959). **Research on helminths as possible vectors of hog cholera.**—Bull. Acad. polon. Ser. Sci. biol. **7,** 143-146. [In English.] **419**

Swine fever was not transmitted to young pigs fed the larvae developing from ascaris eggs taken from worms of pigs with swine fever, or when homogenates of the nematode's eggs were injected s/c, but infection did occur in a few instances when invasive *Strongyloides papillosus* larvae were applied to healthy undamaged skin together with urine or blood containing a high concentration of swine fever virus. Infestation with intestinal worms did not appear to have any adverse effects on the immunity of pigs inoculated with crystal violet swine fever vaccine.—A. Ackroyd.

Biró, J. & Markovits, P. (1959). Kísérletek a sertéspestis-virus elszaporítására szövettenyészetben. IV. Szövettenyészetben nagyobb mennyiségben elszaporított sertéspestis-virus virulenciájának és antigénhatásának viszgálata. [**Propagation of swine fever virus in tissue culture. IV. Virulence and antigenicity of virus.**]—Mag. állator. Lapja **14,** 192-193 & 194. [In Hungarian. Summaries in English and Russian.] **420**

Mass propagation of swine fever virus was attempted in embryonic porcine tissues embedded in chicken plasma. The virulence of 12 cultures was studied on 12 groups of 3–8 pigs weighing 40–50 kg. by giving 3 ml. of one

of the decimal dilutions of the virus filtrate to each pig. 8 cultures caused death in $10^{-5}$, $^{-6}$ dilutions, 3 in $10^{-4}$ dilution and one culture was lethal when undiluted.

The effectiveness of immune sera, taken on the 10th–13th day after injections of a total of 1,500 ml. of the propagated virus to 10 pigs weighing 120–130 kg. was studied on groups of pigs weighing 40–50 kg; each pig was given 0·3–0·4 ml./kg. of the immune serum and challenged with 2 ml. of a virulent virus culture simultaneously. 1 pig in each of 2 groups which were immunized with sera which had been produced by the virus cultures of the lowest ($10^0$ and $10^{-4}$) titres, did not survive the challenge.—A. SEBESTENY.

Newberne, J. W., Johnston, R. V., Robinson, V. B., York, C. J. & Sanders, E. F. (1959). **Recent studies on the properties of a non-virulent living hog cholera vaccine.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 278-289. 421

A report on tests with "Swivax" lapinized virus. 60 pigs of 200 lb. wt. each given 2 ml. vaccine withstood challenge 78–91 days later by 1 × $10^9$ lethal doses. The vaccine is effective with or without swine fever serum. In the field 2,301 herds (175,765 pigs) were vaccinated; losses from all causes amounted to 1·18%. Histological brain changes were used for routine diagnosis: no lesions were found in pigs killed after vaccination and no leucopenia developed in 54 vaccinated pigs. The vaccine virus was not transmitted from vaccinated to susceptible pigs durng a 42–91 day contact and no reversion to virulence was found. The vaccine was considered to be safe and effective. —W. K. DUNSCOMBE.

Kovalenko, Y. R. (1959). **[Influence of immune serum on immunity resulting from subsequent inoculation with lapinized swine fever virus.]**—Veterinariya, Moscow **36,** No. 8 pp. 21-24. [In Russian.] 422

Five pigs were inoculated with immune serum against swine fever, followed 16 days later by an i/m inj. of lapinized virus, with challenge with virulent virus after 42 days. Three developed swine fever. Five pigs treated similarly except for a second dose of lapinized virus 10 days after the first resisted challenge. Ten pigs given one or two doses of the lapinized virus but not the immune serum were also resistant.—M.G.G.

I. Okaniwa, A. & Ishitani, R. (1959). **[Pathological studies on hog cholera. I. Histopathological findings on hogs inoculated with lapinized hog cholera virus.]**—Bull. Nat. Inst. Anim. Hlth, Tokyo No. 37 pp. 19-32. 423

II. Sashara, J., Hayashi, S., Kumagai, T., Sugimura, K., Chikatsune, M., Munekata, K., Nagai, T., Hirasawa, K. & Kato, K. (1959). **[Supplementary studies on lapinized hog cholera virus.]** — Ibid. pp. 33-45. [In Japanese. Abst. from English summaries.] 424

I. Some pigs killed 5–28 days after inoculation of an American lapinized strain of swine fever virus showed perivascular cuffing and small accumulations of microglia in the central nervous system. Three pigs died after inoculation, and disseminated non-purulent encephalomyelitis was present in each case. There was also activation of reticulo-endothelial cells in spleen, liver and blood vessel walls. [12 photomicrographs.]

II. "Rovac" lapinized virus did not increase in pathogenicity after 5 passages in pigs. Clinical response to inoculation was a little stronger in Yorkshire than in Berkshire pigs. 67 of 88 pigs resisted challenge with 10,000 m.l.d. of virulent virus 3, 5 or 7 days after inoculation of lapinized virus.—R.M.

Fontanelli, E., Menascè, I. & D'Ascani, E. (1959). Adattamento del virus della peste suina all'embrione di pollo. **[Adaptation of swine fever virus to chick embryos.]**—Zooprofilassi **14,** 467-473. 425

Defibrinated blood from pigs artificially infected with swine fever was used for the first passages in 13-day-old chick embryos. Thereafter the virus was passaged in series by inoculating material from embryos which died of typical infection. During multiplication the virus produced constant characteristic lesions, which are described in detail. It is concluded that embryo mortality and the lesions are attributable solely to specific action of swine fever virus which has shown itself amenable to cultivation and capable of adapting itself. This is demonstrated by the increase in titre of lethal dose for chick embryos. [See also *V.B.* **12,** p.340; **23,** 1913 & 2273.]—T.E.G.R.

Okaniwa, A., Ishitani, R., Sasahara, J. & Watanabe, M. (1959). **[Studies on transmissible gastroenteritis in pigs in Japan. II. Pathological observations on naturally and experimentally infected cases.]**—Bull. Nat. Inst. Anim. Hlth, Tokyo No. 37 pp. 9-18. [In Japanese. Abst. from English summary.] 426

An account of histological findings in the digestive tract, spleen, kidney and brain of 9 naturally and 21 experimentally infected pigs. Vascular and perivascular infiltrations of round cells in the brain of some cases were like those occurring in swine fever, but tests for swine fever virus were negative.—R.M.

Polding, J. B., Simpson, R. M. & Scott, G. R. (1959). **Links between canine distemper and rinderpest.** — Vet. Rec. **71,** 643-644 & 645. [Authors' summary modified.] **427**

A possible immunological relationship between distemper and rinderpest was confirmed. While passive immunization with rinderpest - immune bovine serum barely influenced the course of distemper in dogs, the injection of rinderpest virus increased the resistance of dogs to distemper. Increased resistance of cattle to rinderpest was not demonstrable, probably because the distemper virus used did not infect.

Hopper, P. K. (1959). **Investigations on neutralizing antibody to canine distemper virus in human serum from different countries.**—Acta Paediat. **48,** 43-48. [Summaries in French and German.] **428**

Sera from normal human beings in the United Kingdom aged between 6 months and 40 years were tested for neutralizing antibody to egg-adapted distemper virus. Almost no antibody was present under 4 years but after this age titres rose rapidly: a high titre was reached by 18–20 years of age and was maintained for a further decade.

Sera from Iceland and parts of Russia where dogs are uncommon gave results generally similar to those found in the U.K. The results were compared with serological findings from other countries and the significance of the antibody was discussed. There was no definite evidence that distemper virus was pathogenic to man.—R.M.

Di Giuseppe, F. & Restani, R. (1959). La precipitazione in gel di agar per il virus della epatite infettiva del cane. **[The gel diffusion precipitin test for canine virus hepatitis.]**—Vet. ital. **10,** 701-708. [Summaries in English, French and German.] **429**

Tissues from 9 dogs were tested for antigen; liver invariably contained it, kidney and myocardium from one dog contained it and the other tissues did not. Repeated addition of serum was necessary. Antibodies were demonstrable in serum samples from hyperimmune, recovered or vaccinated dogs, but not in serum of non-infected dogs.—T.E.G.R.

Pridham, T. J. & Wills, C. G. (1959). **The prevention of virus enteritis in newly weaned mink kits by the use of an homologous tissue vaccine.**—J. Amer. vet. med. Ass. **135,** 279-282. [Authors' summary modified.] **430**

Homologous formolized tissue vaccine devised by Wills for the prevention of virus enteritis of milk was adaptable to commercial production using mink artificially infected at pelting age.

Two lots of vaccine were free from residual infectivity when given by stomach tube and did not produce undesirable reactions upon subcutaneous injection.

The vaccine had considerable reserve antigenic potency. The recommended single dose for newly weaned kits was 2·0 ml. but a single dose of 0·5 ml. gave good protection against experimental challenge, and immunity endured for at least four months.

The vaccine was used prophylactically on about 33,000 kits. Despite evidence that the virus was widely distributed throughout the vaccinated area, losses from virus enteritis were negligible.

Douglas, G. W. (1959). **Myxomatosis. Strains in the field in Victoria, 1950-58.** — J. Dep. Agric. Vict. **57,** 427-430 & 469-476. **431**

This is a brief outline of changes in the myxoma virus in Victoria since its release in 1950. The methods of collecting, testing, and grading the virulence of field strains of the virus are discussed.—W. R. Sobey.

Gill, E., Sullivan, J. F., Stone, H. D. & Hundemann, A. S. (1959). **Role of adjuvants in immunogenicity of killed Newcastle disease vaccines.** — Amer. J. vet. Res. **20,** 357-365. **432**

Groups of chicks were inoculated with beta-propiolactone heat inactivated Newcastle disease vaccine mixed with either crystal violet ethylene glycol, aluminium hydroxide gel, or phosphorylated hesperidin. The immunogenicity of the 3 vaccines was similar, 70–90% of the birds resisting challenge with a homologous and 50–90% with a heterologous strain 10 weeks after primary vaccination. Revaccination appreciably increased the degree of protection.—A. Ackroyd.

Swain, R. H. A. (1959). **The nature of the Newcastle agglutinin in infectious mononucleosis and infective hepatitis.** — J. Path.

Bact. **78,** 67-80. [Author's summary modified.] **433**

The haemagglutinating activity of sera from human beings with infectious mononucleosis, infective hepatitis, and other infections and from healthy adults has been studied by the use of human r.b.c. modified by exposure to Newcastle disease virus. Significantly high levels of serum agglutinin were found in 74% of cases of infectious mononucleosis, 21% of infective hepatitis and in 1% of other infections. No false-positive findings occurred in the serum of healthy adults.

Newcastle agglutinin was also abundant in serum of normal rabbits and present in varying amounts of normal animals of many species. The agglutinin was distinct from serum-mucoid inhibitors of virus haemagglutination. It was a serum globulin distinct from specific antibodies to the virus itself, antibodies of Forssman type, the heterophil antibody of the Paul-Bunnell test, and antibodies to a variety of bacterial and viral antigens. It was more easily destroyed by tryptic digestion than these antibodies.

The antigen provoking the outpouring of the Newcastle agglutinin may be an autoantigen whose liberation from the tissues is greatly aggravated by liver damage in infectious mononucleosis and infective hepatitis.

Prokof'eva, M. T. & Doroshko, I. N. (1959). **[Infectious conjunctivitis in chicks.]**—Veterinariya, Moscow **36,** No. 8 pp. 37-42. [In Russian.] **434**

An infectious conjunctivitis had been present in Ukrainian poultry farms for 2 or 3 years. It affected between 5 and 80% of chicks aged 1–3 months and 30–50% died or became blind. The condition developed in healthy fowls after contact for between 9 and 22 days with affected fowls. Instillation into the conjunctiva of bacteria-free filtrates, some treated with penicillin and streptomycin, produced conjunctivitis in 30% of healthy birds. The agent grew on the chorioallantoic membrane of chick embryos and killed about 40% of embryos within 6 days. Treatment with 3,000–5,000 units of streptomycin in oil, 2 or 3 doses given i/m at intervals of 7–8 days, had prophylactic and therapeutic action.—R.M.

Casorso, D. R. & Jungherr, E. L. (1959). **The response of the developing chicken embryo to certain avian pathogens.**—Amer. J. vet. Res. **20,** 547-557. **435**

The histopathological features in exsanguinated viable chick embryos produced by avian encephalomyelitis (AE), infectious hepatitis (AIH), and infectious synovitis viruses and avian pleuropneumonia-like organisms (PPLO) are described. The responses of the embryo to infectious synovitis and AIH viruses were similar to those of the adult. With AE viruses, embryos were grossly atrophied and specific neuronal degenerative lesions were observed from the 5th day in the brain and spinal cord with minimal inflammatory responses. PPLO produced a heterophilic perivasculitis, most prominently around the hepatic vessels. Periarteritis in the lung developed only terminally. No consistent lesions were produced by Newcastle disease and infectious bronchitis viruses.

—A. Ackroyd.

Keller, R. & Zatzman, M. L. (1959). **Studies on the factors concerned in the disappearance of bacteriophage particles from the animal body.**—J. Immunol. **83,** 167-172. [Authors' summary modified.] **436**

The fate and translocation of bacteriophage particles were investigated after single i/v inj. of large numbers of particles into normal dogs. The rate of disappearance of particles from the circulation was rapid during the first 20 min. Later the rate of disappearance slowed and particles persisted for at least 90 min. Passage of particles across the renal barrier was irregular and was related to plasma concentration. Organs of the reticuloendothelial system such as liver and spleen concentrated phage particles by 196 to 873 times the plasma conc.

Taylor, A. R. (1959). **Theoretical and practical considerations of germfree animals in virology.**—Ann. N.Y. Acad. Sci. **78,** 102-115. **437**

This review forms part of the proceedings of a conference on the present status of germfree vertebrates. T. discussed problems of culturing cells from germ-free fowls and experiments with carcinogenic viruses.

I. Welsh, H. H., Jensen, F. W. & Lennette, E. H. (1959). **Q fever studies. XX. Comparison of four serologic techniques for the detection and measurement of antibody to Coxiella burnetii in naturally exposed sheep.** —Amer. J. Hyg. **70,** 1-13. **438**

II. Welsh, H. H., Lennette, E. H., Abinanti, F. R., Winn, J. F. & Kaplan, W. (1959). **Q fever studies. XXI. The recovery of Coxiella burnetii from the soil and surface**

**water of premises harboring infected sheep.** —Ibid. 14-20. [Authors' summaries modified.] **439**

I. Four serological methods were compared on 1,017 sera from 113 sheep naturally exposed to infection during 3 years. They were the c.f. test, the standard rickettsial agglutination test, capillary agglutination test and the microscopic slide agglutination test. The last was much better than the other 3 in sensitivity and ability to detect antibody, and it appeared to be highly specific. There was good agreement between the results of the microscopic slide test and the standard agglutination and capillary agglutination tests, when reactions occurring at the lowest serum dilutions in the last two tests were regarded as significant.

II. Viable rickettsia were present in soil for up to 150 days, an interval encompassing the entire lambing season. Recovery of the organism from air at times other than the lambing season may be due to disturbances of contaminated ground surfaces. The concentration of rickettsia in soil suggested that secondary (dust) aerosols may lead to infection of man and livestock in the absence of active shedding of the rickettsia by infected animals. Rickettsia disappeared from sampled plots after the lambing season and recontamination occurred during the next lambing season.

Sureau, P. (1959). Enquête sérologique concernant la fièvre Q à Madagascar. **[Serological survey of Q fever in Madagascar.]** — Arch. Inst. Pasteur Madagascar **27,** 35-36. **440**

The plate micro-agglutination test for Q fever was positive in 28 of 52 sheep, 7 of 26 cattle, 15 of 100 pigs, and 12 of 103 human beings in Madagascar.—M.G.G.

*See also absts.* **597** (rabies in Nyasaland); **598** (F. & M. disease in Israel).

## IMMUNITY

Consden, R. & Kohn, J. (1959). **Cellulose acetate as a medium for immuno-diffusion.**— Nature, Lond. **183,** 1512-1513. **441**

For immuno-diffusion purposes, solid cellulose acetate membrane fulfils all requirements and has several advantages over agar gel. A piece is cut from a membrane strip and soaked in the desired buffer solution. After removal of excess moisture, the membrane is supported in a horizontal position in a moist chamber and small amounts (1–5 $\mu$l.) of the antigen and antiserum are applied to the membrane surface as spots or lines. When the drops have soaked in, the membrane is immersed in a bath of liquid paraffin or Whitemor 120 oil for 2 days. The membrane is then cleaned, washed and stained with Ponceau S or Nigrosine WS. to render the precipitin lines visible. Cellulose acetate can also be used for immuno-electrophoresis.—A. Ackroyd.

Fishman, M. (1959). **Antibody formation in tissue culture.** — Nature, Lond. **183,** 1200-1201. **442**

Although addition of untreated bacteriophage T2, haemocyanin or suspensions of rat macrophages from peritoneal exudates obtained 48 hours after i/p inj. of beef infusion broth had no effect on tissue cultures of lymph node cells from normal rats, antibodies were formed when the antigens were first incubated with macrophages at 37°C. for 30 min. and a cell-free filtrate of the mixture added to the tissue cultures. Pretreatment of the virus with rabbit macrophages or with HeLa cells was without effect.—A. Ackroyd.

Nossal, G. J. V. (1959). **Antibody production by single cells. III. The histology of antibody production.** — Brit. J. exp. Path. **40,** 301-311. **443**

N. prepared cell suspensions from popliteal lymph nodes of rats which had been injected in the hind foot pads with a flagellar antigen prepared from *Salmonella adelaide.* These cells were isolated in micro-droplets and motile *S. adelaide* put into such a droplet were immobilized if the cell therein was producing antibody. Later, fixative and stain were instilled into the droplets enabling the histological nature of the cell to be confirmed. Of 601 cells thus classified, 93 made antibody and 91 of these were plasmablasts or plasma cells. —R.M.

Kerr, W. R., Pearson, J. K. L. & Rankin, J. E. F. (1959). **The bovine udder and its agglutinins.**—Brit. vet. J. **115,** 105-119. **444**

Antibody production was measured by agglutination tests on whey and blood serum after infection into the udder of the following antigens, alive or dead: *Br. abortus, S. pullorum,* coagulase-positive *Staph. aureus* and *Tr. foetus.* It was possible to stimulate anti-

body production in the non-lactating udder by repeated infusions of dead antigen, but it appeared impossible to find an active antigen that did not irritate mammary tissue.—R.M.

Garvey, J. S. & Campbell, D. H. (1959). **The in vivo stability of antibody.**—J. exp. Med. **110,** 355-368. [Authors' summary modified.] 445

In rabbits fed $S^{35}$-labelled amino-acids and simultaneously injected with antigen at the peak of antibody production, the circulating antibody became labelled with the isotope within a few hours. The specific radioactivity of antibody was measured as antibody was allowed to decline in the absence of antigenic stimulation. At various times, in different animals, antigen was re-injected and circulating antibody measured for specific radioactivity. The initial antibody after the antigenic stimulus always had a higher specific activity than antibody circulating just before the re-injection. This appearance of antibody of higher specific activity was demonstrably a specific response to the antigen re-injected. It was concluded that there is a reservoir of antibody stabilized in tissue and not in equilibrium wth that in circulation. A mechanism for this stabilization is suggested and discussed from previous investigations demonstrating the long retention of antigen in liver tissue.

Olsson, B. (1959). **Studies on the formation and absorption of antibodies and immune globulins in piglets. II. The intestinal absorption of antibodies and immune globulins by new-born piglets after the administration of bovine colostrum. III. The intestinal absorption of heterologous antibodies and serum proteins in piglets.**—Nord. VetMed. **11,** 375-390 & 441-460. [In English. Summaries in German and Swedish. Author's summaries modified.] 446

Eighteen piglets were fed bovine colostrum containing H agglutinins against *Salmonella paratyphi A.* Feedings were commenced immediately after birth and repeated every second hour during the first 12 hours of life.

Comparison with piglets fed porcine colostrum indicates that immune globulins in bovine colostrum are absorbed as readily as those in porcine colostrum.

Sixteen piglets from three litters were given immune horse serum containing agglutinins against *S. cholerae-suis* through a stomach tube commencing immediately after birth. 75 ml. serum were administered during 10 hours. Blood samples were taken 6 hours after the last administration.

Electrophoresis was carried out on the immune serum administered, umbilical cord serum, and on serum from the piglets after feeding. Agglutinin titres, total protein, and non-protein nitrogen for the same serum samples were also determined.

Agglutinins against salmonella were demonstrated in the serum of all piglets after the administration of horse serum. The mean relative absorption of agglutinin was calculated to be 11·7% with a range of 4·6 to 24·8%.

The mean relative absorption of beta plus gamma globulin was 8·7% (range 5 to 12·8%), while that of albumin plus alpha-1 globulin was 3·5% (range 0·4 to 9·8%).

The results obtained demonstrate that immune globulins in horse serum are absorbed by piglets from the intestine as readily as immune globulins in pig serum. [See also *V.B.* **29,** 2831.]

Coombs, R. R. A. & Roberts, F. (1959). **The antiglobulin reaction.**—Brit. med. Bull. **15,** 113-118. 447

Some antibodies will unite with their specific antigens on red cells and in microbial systems without bringing about subsequent agglutination. These incomplete antibodies, being globulins, can be detected on sensitized cells by appropriately absorbed antiserum against the globulin prepared in a suitable animal (direct antiglobulin test), or by exposing cells to serum containing blood group antibodies and then applying the test (indirect antiglobulin test). Other tests for recognizing incomplete antibodies include agglutination tests in media other than saline (albumin method), and application of the proteolytic enzymes trypsin, ficin, or papain to red cells. Inhibition of the antiglobulin reaction by gamma-globulin has provided a means of determining the species specificity of serum samples and of detecting antibodies against leucocytes, platelets and tissue cells. Other applications or adaptations of the test include investigating incomplete or non-precipitating antibody to soluble antigens and its use with fluorescent antibody for localizing antigens in cells and tissues.—A. Ackroyd.

Buckland, F. E. (1959). **Impairment of viral haemagglutination of red cells after treatment with formalin.**—Nature, Lond. **183,** 1276. 448

Although human Group O red cells

incubated with formalin overnight were frequently more readily agglutinated by some strains of the myxoviruses and by the Col SK virus than were untreated cells the reverse was observed with the adenovirus 9 and the ECHO viruses 10 and 11. Frequently no agglutination occurred although untreated cells were strongly agglutinated. It seems probable that the red cell receptors with which the myxoviruses and Col SK virus react are different from those with which the ECHO and adenoviruses react.
—A. Ackroyd.

Hašek, M., Hraba, T. & Hort, J. (1959). **Acquired immunological tolerance of heterografts.**—Nature, Lond. **183,** 1199-1200. **449**

In experimental embryonal turkey/fowl parabiosis, a relatively high degree of heterologous tolerance has sometimes been obtained as a result of the large amount of powerful antigen stimulus and the formation of cell chimeras. Survival of a fowl skin graft for 3 months was obtained in a turkey parabiont whilst in another turkey parabiont, 2 skin heterografts from fowls, applied at the age of 12 months, survived till the death of the recipient 80 days later. A guinea-fowl heterograft applied at the same time was destroyed in the normal time. Interspecific blood chimerism was also demonstrated in turkey/fowl parabionts for up to 14 months. Erythrocytes containing turkey and fowl agglutinogens simultaneously could not be demonstrated.

Billingham, R. E. & Brent, L. (1959). **Quantitative studies on tissue transplantation immunity. IV. Induction of tolerance in newborn mice and studies on the phenomenon of runt disease.**—Philos. trans. roy. Soc. Ser. B. **242,** 439-477. **450**

Actively acquired tolerance of homologous tissues in new-born mice was induced by i/v inj. of cells from spleen, bone marrow or thymus. Injection of homologous lymphoid cells into new-born mice led to the development of a syndrome characterized by retardation of development and referred to as runt disease. The theory that runt disease was infective in origin was discarded. On the contrary it was shown conclusively that runt disease was the consequence of immunological reaction of the homologious cells against the tissues of their hosts.—R.M.

Roberts, F. (1959). **Haemolytic disease of the new-born.**—Brit. med. Bull. **15,** 119-122. **451**

Haemolytic disease of the new-born occurs in human beings, horses and pigs. In man there is evidence of transplacental immunization. Administration of crystal violet swine fever vaccine to sows provokes formation of blood group antibodies in black breeds which do not possess one or both of the antigens found almost universally in white breeds; haemolytic disease is therefore most frequent in the offspring of black sows served by Large White boars. In contrast to man, antibody does not reach the foetus in the uterus of mares and sows; the animal is born healthy and receives concentrated antibody in colostrum and milk. When the antibody is powerful, first ingestion of colostrum causes acute destruction of blood and death without jaundice may result in 48 hours. Nuclear icterus is not seen in foals or piglets. As the disease in pigs is an artificial condition, the risk can be reduced by vaccinating sows when their litters are weaned, thus allowing the maximum time for antibody titres to wane before the next farrowing. In the horse, selection of compatible stallions is one solution, whilst if the disease is diagnosed antenatally, the foal can be saved by removing it from the mare at birth and nourishing it on cow's milk for the first 3 days.—A. Ackroyd.

Yunin, A. N. (1958). **[Influence of hair, feeding and age on skin permeability: studies with radiosulphur.]**—Bull. Informatsii Vsesoyuz. Inst. vet. Sanit. No. 3 pp. 33-37. [In Russian.] **452**

Y. used colloidal $^{35}S$ in a 2% water/oil emulsion of diethylxanthogen, applied to skin in doses of 4–6 $\mu$ c/sq. cm., giving 7–10 million counts per min. from an area of 20 sq. cm. 8 Russian Merino sheep and 18 Chinchilla rabbits were employed. Penetration of skin was assessed by measuring radioactivity of blood, urine and faeces at intervals between 5 min. and 120 hours after application. Results are shown in two tables. The general conclusions were that penetration was most rapid in emaciated and young animals, and in moulting rabbits. [Previous studies were reported in *Bull. Informatsii* No. 2, pp. 11–12 (1957).]
—R.M.

*See also absts.* **401-402** (properties of interferon).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Scott, M. T. (1959). **Recent developments in the control of blowfly strike in sheep.**—Vet. Rev. Annot. **5**, 59-71. **453**

S. discussed insecticides used to protect sheep against blowflies from 1946 to date, with reference to insecticide-resistance in blowfly larvae and methods of applying insecticides to sheep.—R.M.

Bushland, R. C. (1959). **New research results with systemic insecticides.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 192-197. **454**

Trolene (Dow ET-57) orally at 100 mg./kg. and Co-Ral (Bayer 21/199) as a 0·5% spray are now in use for warble control. Dimethoate (Am. Cyanamid 12,880) is possibly too toxic for general use, although it may be of value as a late-season intramuscular treatment.

The standard insecticide screening test on g.pigs and the organization of research on systemics are described, and toxicological problems are discussed.—W. N. Beesley.

Sharman, R. S. (1959). **Screwworm eradication program in the southeastern United States.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 183-186. **455**

The organization of the Florida screwworm fly eradication programme is described. 50 million sterile flies are bred out weekly; cold weather in January 1958 depressed fly populations considerably; aeroplane fly releases were therefore advanced and eradication is proceeding well. 80 inspectors check cattle in 5 neighbouring States and eradication from the entire area should be complete in 2 years.

—W. N. Beesley.

Drudge, J. H., Leland, S. E., Jr., Wyant, Z. N. & Elam, G. W. (1959). **Critical tests on the organic phosphate insecticide, Dimethoate, against Gastrophilus spp. in the horse.** — J. Parasit. **45**, No. 4 Sect. 2 p. 56. **456**

Single doses were administered by stomach tube at 10, 20, 40, 60, and 80 mg. per kg. body weight. Doses of 40 mg. per kg. and above were completely effective in removing 3rd instar *Gasterophilus nasalis*. Against 3rd instar *G. intestinalis* activity was less and only half were removed by 60 mg. per kg. None were removed in one horse given 80 mg. per kg. Doses of 60 mg. per kg. and above were toxic.

Repeated small doses administered in the feed greatly increased the efficacy. In one horse, three daily doses of 20 mg. per kg. in grain removed all 2nd and 3rd instar *G. nasalis* and nearly all 2nd and 3rd instar *G. intestinalis*.—R.M.

Heirman, A. L. (1959). Enkele gegevens over de bestrijding van dierlijke ectoparasieten in Panama. (Ervaringen met Asuntol, een nieuw tekenbestrijdingsmiddel). [**Control of ectoparasites of animals in Panama, with reference to "Asuntol".**] — Tijdschr. Diergeneesk. **84**, 1026-1028. [In Dutch. Summary in English.] **457**

Six parasiticides were tried for control of *Dermatobia hominis* larvae on cattle. Satisfactory results were obtained only with "Asuntol" (Bayer 21/199) as a 0·15% dip or a 0·25% spray. Another important ectoparasite was *Boophilus microplus*.—R.M.

Anon. (1959). **The new "face fly" pestering Illinois cattle.** — Timely Topics, Univ. Ill. September 1959 pp. 2. **458**

The face fly *Musca autumnalis* clusters around the eyes and noses of cattle. It closely resembles the house-fly but is slightly larger and has different habits. It was first reported in North America in Nova Scotia in 1952, coming originally from Europe or Asia. Face flies are now present on both beef and dairy cattle throughout the northern two-thirds of Illinois, where the average is 20 to 60 flies per animal. No flies have been collected in the southern third of the State.

Face flies are very persistent and cause great annoyance to animals, even though they do not suck blood. Infested animals bunch up, twitch their ears, and shake and rub their heads. Often the animals' eyes will water excessively, and it is suspected that "pink-eye" may be spread by the fly. Milk and butterfat production may also be reduced. Insecticide treatments were discussed.—R.M.

Anon. (1959). **Report of committee on parasitic diseases.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 187-191. **459**

Dimethoate (Am. Cyanamid 12,880) used i/m as a 50% soln. at 25 mg./kg. gave very good control of *Oestrus ovis*, especially in the first instar, but this compound is only available experimentally so far.

*Boophilus microplus* ticks were found in Florida and all affected farms quarantined; the final quarantine was lifted in the next year. 20,000 deer (alternative hosts to cattle) were slaughtered in the eradication programme.

Although psoroptic mange of cattle was almost absent (6 cases in 1957) sheep scab appeared to be increasing, with 200 outbreaks in 1957.—W. N. Beesley.

Knipling, E. F. (1959). **Insecticide recommendations of the Entomology Research Division for the control of insects attacking crops and livestock, 1959 season.** pp. 129. Washington. U.S. Govt. Print. Off. 65 cents. [Agriculture Handbook No. 120.] **460**

Recommended insecticides for parasites of livestock are listed between pages 118 and 125. The main difference compared with the 1958 edition [*V.B.* **28,** 3616] is the inclusion of Bayer 21/199 for treatment of warble fly larvae, horn flies, lice, screw-worms and ticks in beef cattle (not milch cows); fly larvae, lice, keds and ticks in sheep and goats; and lice in pigs. At least 60 days should elapse between treatment with this drug and slaughter.—R.M.

Robbins, W. E., Hopkins, T. L., Darrow, D. I. & Eddy, G. W. (1959). **Studies with $P^{32}$-Bayer 21/199 sprayed on cattle.**—J. econ. Ent. **52,** 214-217. [Authors' summary modified.] **461**

The metabolism, excretion, and tissue distribution of radiophosphorus-labelled Bayer 21/199 were studied, after spraying two bulls. Only small amounts of radioactive compounds were found in the blood, and these behaved like polar degradation products. The compound appears to have been sparingly absorbed, about 2·4% (suspension) and 6·3% (emulsion) of the applied dose being accounted for in the urine of the two animals 2 weeks after treatment. At that time only very low levels of organo-soluble compounds which behaved like 21/199 were present in the tissues, but considerable residual unchanged 21/199 was present externally.

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

Demidov, N. V. (1959). **[Further studies on difluortetrachlorethane (Freon-112) against liver flukes in cattle.]** — Bull. Informatsii vsesoyuz. Inst. Gel'mint. No. 4 pp. 36-38. [In Russian.] **462**

Because difluortetrachlorethane was solid below 24°C., is was dissolved in difluordichlormethane (Freon-12) before use. The mixture was harmless for cattle at the recommended anthelmintic dose of 0·3–0·4 ml. per kg. body wt. It was administered by mouth in capsules or directly into the rumen by injection. Controlled trials on 60 cattle indicated that treatment was highly effective.—R.M.

Lienert, E. (1959). Experimentelle Untersuchungen zur Chemotherapie der Distomatose. II. Mitteilung. Implantation geschlechtsreifer Exemplare von Fasciola hepatica L. unter die Rückenhaut der weissen Ratte. **[Experimental research on chemotherapy of fascioliasis. II. Implantation of mature flukes beneath the skin of the back in rats.]** — Wien. tierärztl. Mschr. **46,** 423-430. [Summaries in English, French and Italian.] **463**

950 adult *F. hepatica* were implanted subcutaneously in the lumbar region of 147 rats. The survival rates after 4, 5 and 6 days from the time of inoculation were, respectively, 81% of 208 flukes, 74% of 590 and 90% of 152. These are much better than the survival rates of 71%, 52% and 42% after intraperitoneal implantation.—M.G.G.

Reid, W. M. & Nugara, D. (1959). **Report on Raillietina williamsi in the domestic turkey.**—J. Parasit. **45,** No. 4 Sect. 2 p. 45. **464**

There appeared to be no previous report of this species from turkeys. All except 2 of 150 birds examined in a flock of 1,400 harboured from 1 to 175 worms each. Treatment with 65 or 125 mg. a bird of dibutyl-tin-oxide administered in capsules was very effective. Treatment with 0·29% dibutyl-tin-dilaurate in the feed for 5 days was 85% effective and feeding Trithiadol to 18 birds at 3 lb. per ton of feed was 50% effective after 5 days.—R.M.

Hemmes, G. D. (1959). Over de vraag hoe echinococcosis-besmetting tot stand kan komen. **[How an echinococcus infection can come about.]** — Tijdschr. Diergeneesk. **84,** 832-839. [In Dutch. Summaries in English, French and German. English summary modified.] **465**

In the province of Utrecht where meat inspection and destruction of rejected material is carried out, autochthonous cases of human hydatid disease have not been observed, nor

carriers of echinococcus. Nevertheless, isolated cases of hydatid disease occur in cattle. Rye from South America, contaminated with sand, is used in cattle meal. It was suggested that this sand could contain faeces from infected dogs.

Zimmermann, W. J., Hubbard, E. D. & Mathews, J. (1959). **Studies on fecal transmission of Trichinella spiralis.** — J. Parasit. **45,** 441-445. [Authors' summary modified.] **466**

Investigations on faecal transmission were carried out using fox cubs and albino rats as donors, and pigs, rats and fox cubs as recipient hosts.

The following factors affected transmission; time between infection and passage of faeces by donor; relative immunity of donor; and number of trichinae ingested by the donor. Most of the larvae passing through the intestinal tract of the donors were recovered from faeces eliminated within 24 hours after ingestion. Immune animals eliminated a larger percentage of the administered trichinae than non-immune animals.

Sella, A. (1959). Il dosaggio della fenotiazina nella lotta contro la strongilosi equina. **[Dosage of phenothiazine in the treatment of strongylosis in horses.]**—Clin. vet., Milano **82,** 199-202. [Summary in English.]. **467**

Small daily doses of phenothiazine proved more effective in horses than massive doses at longer intervals, this difference being noticeable after 20 days but strongly marked after 7 months. Reasons are discussed. Secondary effects are absent when small doses are used, large doses showing some toxicity.

—F. R. Paulsen.

Shorb, D. A. & Shalkop, W. T. (1959). **Possible significance of the retention of immature larvae of Oesophagostomum quadrispinulatum (O. longicaudum) in the intestinal mucosa of swine after single infections.**—J. Parasit. **45,** No. 4 Sect. 2 pp. 41-42. **468**

Single doses of 150,000 to 209,000 infective larvae of the nematode were administered to 26 worm-free pigs, 42 to 70 days old, weighing 17 to 50 lb. They were killed from 1 to 65 days after infection, and the population of nodular worms in the large intestine and intestinal mucosa was estimated. Nematodes in the mucosa were extracted by artificial digestion. Although larvae remained alive for up to 27 days after infection, there was sufficient tissue reaction surrounding them to prevent their escape from the mucosa. Since histological evidence indicated that the larvae in the mucosa of the pigs killed 51 and 65 days later were dead, the authors concluded that trapped larvae had been overwhelmed by the host's defences and would eventually die.

—R.M.

Roche, M. & Pèrez-Giménez, M. E .(1959). **Intestinal loss and reabsorption of iron in hookworm infection.**—J. Lab. clin. Med. **54,** 49-52. **469**

Loss of iron in 14 human beings infected with hookworms was measured by labelling circulating erythrocytes with radiochromium and radio-iron. Between 3 and 21 mg. of iron were lost daily through bleeding into the intestine; about 44% was re-absorbed and the remainder was excreted in faeces.—R.M.

Leland, S. E., Jr., Drudge, J. H. & Wyant, Z. N. (1959). **Blood and plasma volume, total serum protein, and electrophoretic serum fractionation of sheep experimentally infected with Trichostrongylus axei.**—J. Parasit. **45,** No. 4 Sect. 2 p. 42. **470**

Eighteen sheep 5–22 months old were infected with single doses of 50,000 to 1,500,000 larvae.

Serum protein alterations were hypoproteinaemia and hypoalbuminaemia with increase in gamma globulin. Polycythaemic hypovolaemia developed which, if the animal survived, developed into an oligocythaemic hypovolaemia.—R.M.

Herlich, H. & Merkal, S. (1959). **Studies on the serological and immunological responses of calves artificially infected with the stomach hairworm, Trichostrongylus axei.**—J. Parasit. **45,** No. 4 Sect. 2 p. 42. [Authors' abst. modified.] **471**

Calves were artificially infected by administration of single and multiple doses of infective larvae, single doses of fourth-stage, fifth-stage, and sexually-mature worms, or sexually-mature worms only. Production of circulating antibodies was detected by haemagglutination tests with adult *Haemonchus contortus* from sheep as a source of antigen. Titres as high as 1 : 1,280 were noted, the highest being in calves given infective larvae. From faecal egg counts and post-mortem worm counts it was found that the serological responses were not accompanied by active immunity.

Artificially exsheathed infective larvae of *T. axei* were incubated in saline, serum from

artificially infected calves, or serum from helminth-free calves. Larvae remained viable in all media for 72 to 96 hours, and no larval precipitates were observed. Exsheathed larvae also appeared to be unaffected when incubated in serum from a calf heavily infected with several species of nematodes including *T. axei.*

Rose, J. H. (1959). **The nematodes Ostertagia lyrata Sjöberg, 1926, and Trichostrongylus longispicularis Gordon, 1933, in British cattle.** —Nature, Lond. **183**, 1745-1746. **472**

*O. lyrata* has been found in the abomasum of cattle and *T. longispicularis* in the small intestine. The copulatory bursa and spicules of *O. lyrata* differ from those of *O. ostertagi* and *O. circumcincta.* The spicules of *T. longispicularis* are slightly longer than those of *T. colubriformis*; the gubernacula are easily distinguishable. There is no evidence of the pathogenicity of the two species.

*O. lyrata* has been recorded in sheep, cattle, deer in Europe, North America and Africa. *T. longispicularis* has been recorded in cattle and sheep in Australia and North America.—B. M. Wilson.

Mayhew, R. L. (1959). **Studies on bovine gastrointestinal parasites. XXII. Rate of consumption of phenothiazine in salt-phenothiazine mixtures by cattle.**—Amer. J. vet. Res. **20**, 498-504. **473**

The amount of a 10 : 1 salt–phenothiazine mixture consumed by cattle often provided less than 0·5 g. of phenothiazine, which is the minimum necessary for controlling parasitic larval development. At a given time different individuals consumed varying amounts of mixture and of salt alone, and some individuals consumed different amounts at different times, although there was no consistent seasonal variation. Addition of molasses to the mixture did not increase consumption.

—B. M. Wilson.

Kates, K. C., Wilson, G. I. & Turner, J. H. (1959). **Experimental studies on the relationship of Ostertagia circumcincta to parasitic gastritis in sheep and goats.**—J. Parasit. **45**, No. 4 Sect. 2 pp. 42-43. [Authors' abst. modified.] **474**

Parasite-free lambs were infected with *O. circumcincta* by single doses of between 25,000 and 200,000 infective larvae and by 9 weekly doses each of 25,000. Pairs of parasite-free kids were similarly infected.

Lambs killed during the prepatent period had substantial infections and typical lesions. No obvious clinical symptoms were associated with the infections, and significant departures from normal weight gains were noted only in two pairs of kids given the largest numbers of larvae. If these results are substantiated by further work, it may be concluded that this parasite has a lower pathogenic potential than other abomasal nematodes of sheep and goats.

Becklund, W. W. (1959). **Spicular anomalies in Haemonchus contortus that may be associated with exposure to phenothiazine.** — J. Parasit. **45**, No. 4 Sect. 2 p. 45. [Author's abst. modified.] **475**

Since a causal relationship between exposure of these parasites to phenothiazine and the occurrence of abnormalities in the adult spicules was suspected, specimens which had not been exposed to phenothiazine were examined. Of 4,381 male *H. contortus* collected from 37 sheep and deposited in the United States National Museum Helminthological Collection between 1900 and 1939, only 1 male had aberrant spicules. Of 643 specimens collected between 1951 and 1958 from 4 sheep that had never been treated with phenothiazine, only 2 males had abnormal spicules.

Marquardt, W. C., Fritts, D. H., Senger, C. M. & Seghetti, L. (1959). **The effect of weather on the development and survival of the free-living stages of Nematodirus spathiger (Nematoda: Trichostrongylidae).** — J. Parasit. **45**, 431-439. [Authors' summary modified.] **476**

The effect of weather in southwestern Montana on development and survival of *N. spathiger* was studied over 4 years.

Development of ova occurred throughout the year except the coldest months of the winter. Development was most rapid between April and September. Development was slow and few embryos developed to the infective stage between October and March.

Infective larvae survived longest in the cool or cold season; at least 10% could survive the winter.

The combination of relatively slow development and long survival of free-living stages indicated that the largest numbers of infective larvae occurred on pasture in spring. Agents most detrimental to the free-living stages were sunlight and a high surface temperature of the soil.

Baxter, J. T. (1959). **Nematodirus spp. infection and resistance in lambs.**—Vet. Rec. **71,** 424. 477

Gibson suggested that there is a difference in inherent resistance of lambs to *Nematodirus* species [*V.B.* **29,** 3202]. Baxter suggests that infected animals may void large numbers of mature and immature worms as a result of inflammatory changes in the intestinal mucosa, or of the self-cure mechanism. The resistance acquired as a result of a previous infection is not absolute. *N. filicollis* and *N. battus* are represented in spring and autumn peaks of larval emergence. *N. filicollis* eggs may hatch in the summer of the same year in which they are voided, those of *N. battus* do not hatch until the following spring. The infection of a vacant contaminated pasture can persist for 2 years.—B. M. Wilson.

Rawes, D. A. & Scarnell, J. (1959). **Bephenium hydroxynaphthoate — its activity against nematodirus and other trichostrongylid nematodes in lambs.**—Vet. Rec. **71,** 645-649 & 650. [Authors' summary modified.] 478

The anthelmintic efficiency of bephenium hydroxynaphthoate against the nematodes causing parasitic gastro-enteritis in lambs was studied; methods used and results obtained are described. The drug is recommended for use in the prevention and treatment of nematodiriasis and other forms of parasitic gastro-enteritis in the unweaned lamb.

Cornwell, R. L. (1959). **Parasitic bronchitis: the vaccinated calf as a carrier.**—Vet. Rec. **71,** 562. 479

Of 18 calves given two doses of an irradiated larval vaccine for husk and turned out to grass after 4 or 5 weeks, four were removed and found negative for lungworm larvae. They were put on a reseeded clean pasture with six clean unvaccinated control calves. At a second faecal examination 10 days later, two of the test calves were excreting *Dictyocaulus viviparus* larvae; the other two test calves began to excrete larvae after a further 3 and 10 days, respectively. 31 days after the test calves were put on the clean pasture the controls began excreting larvae, and all the calves were coughing. Presumably vaccination does not always confer a strong enough resistance to natural infection and such calves can infect a clean pasture and are a potential source of infection to unvaccinated stock.—B. M. Wilson.

Rubin, R. (1959). **The efficacy of cyanacethydrazide in calves experimentally infected with Dictyocaulus viviparus.**—J. Parasit. **45,** No. 4 Sect. 2 p. 57. [Author's abst. modified.] 480

Efficacy of treatment was based on comparison of the total number of worms recovered at slaughter in the treated and untreated groups, 2–3 weeks after treatment. Cyanacethydrazide was ineffective when given starting 14 days after exposure, and only moderately effective when first given 20 or 21 days after exposure. When given 5 days after the beginning of patency, treatment in most instances considerably reduced the total number of worms as compared with infected untreated calves.

Ozerskaya, V. N. & Popova, K. A. (1959). **[Comparison of ditrazine phosphate and piperazine sulphate against dictyocaulus infestation in sheep.]**—Bull. Informatsii vsesoyuz. Inst. Gel'mint. No. 4 pp. 51-53. [In Russian.] 481

Ditrazine (diethylcarbamazine) phosphate dissolved in water was given s/c at 0·1 g./kg. body wt. to 27 wethers aged 9–10 months naturally infested with *Dictyocaulus*. Some sheep received a second injection 24 hours after the first. All lungworms were killed in 9 of 10 given one dose, in 8 of 10 given two doses, and 4 of 7 given the drug dissolved in 1% soln. of amidopyrine. Piperazine sulphate was not so effective: only 3 of 10 heifers were freed from lungworms after a s/c inj. of 8–15 ml. of 33% soln. 5 untreated wethers died. —R.M.

Jarrett, W. F. H. (1959). Méthode de vaccination contre l'helminthiase. **[Vaccines for control of helminth infection.]**—Bull. Off. int. Epiz. **52,** May pp. 241-251. 482

An account in French of experiments and field trials culminating in the commercial production of a vaccine consisting of irradiated lungworm larvae.—M.G.G.

Douglas, J. R. & Baker, N. F. (1959). **The chronology of experimental intrauterine infections with Toxocara canis (Werner, 1782) in the dog.**—J. Parasit. **45,** No. 4 Sect. 2 pp. 43-44. [Authors' abst. modified.] 483

Eight worm-free, cage-reared bitches 11 to 21 months old were given 20,000 infective *T. canis* eggs at various times during pregnancy. Surgical removal and peptic digestion of foetuses at various intervals demonstrated that invasion of the foetus did not occur before

the 42nd day of gestation. Larvae required at least 14 days after infection of the bitch to invade tissues of the uterus and foetus. Five bitches kept free from re-infection were bred again and whelped 241 to 358 days after the initial infection. Faecal examination revealed that patent *T. canis* infections developed in every litter within 23 to 40 days of whelping and in every bitch within 25 to 46 days of whelping. These infections persisted in the bitches 9 to 108 days (average 60) and then ceased spontaneously.

Dorrington, J. E. (1959). **The treatment of Filaroides osleri infestation with Dictycide.**—J. S. Afr. vet. med. Ass. **30,** 27. **484**

Coughing due to *F. osleri* was cured in 6 Boxer dogs by administering 1 g./10 lb. body wt. of cyanacethydrazide for varying periods. Nodules caused by the parasite have been reported in clinically healthy dogs.

—B. M. Wilson.

Otto, G. F. & Bauman, P. M. (1959). **Canine filariasis.**—Vet. Med. **54,** 87-96. **485**

The authors consider that *Dirofilaria immitis* is transmitted only by certain species of mosquito; that fleas can be infected but do not transmit infection to the dog.

Difference in size and shape of tail, between *D. immitis* and *Dipetalonema* sp. with which it may be confused, are described and staining methods given. Diagrams and photographs accompany the article. In the U.S.A. the disease is found mostly along the southern sea coasts. For treatment 15 daily doses of thiacetarsamide (arsenamide) has slight advantages over other phenylarsenoxides. Phenylarsenoxides are primarily lethal for the adult worms. 1% Caparsolate sodium (0·2 ml. per lb. body wt. intravenously daily for 3 days) is effective.

The killed worms when swept into the pulmonary arteries form emboli which may be fatal in 5% of cases. There is no known drug which kills the worms in the developmental stages in the tissues.—Irene M. Dixon.

Rothstein, N., Brown, M. L. & Carithers, R. W. (1959). **Vital staining and differentiation of microfilariae.**—J. Parasit. **45,** No. 4 Sect. 2 p. 38. [Authors' abst. modified.] **486**

Vital staining of microfilariae with acridine orange provided means for rapid scanning of whole blood suspensions to detect the viable microfilariae with the aid of dark ground illumination and glass colour filters. Differentiation of viable microfilariae of *Dirofilaria immitis, D. uniformis,* and *Dipetalonema* sp. has been accomplished with the closely related dye, Coriphosphine O. This has demonstrated cytochemical differences among these microfilariae which may imply physiological differentiation. Fourteen surveys with a total of 724 dogs from Alabama, Pennsylvania and Rhode Island have been completed.

Trawinski, A. (1959). Diagnostic à l'aide des méthodes séro-allergiques, des maladies parasitaires des moutons, provoquées par les vers. **[Serological allergic tests in diagnosis of helminth infections of sheep.]** — Bull. Off. int. Epiz. **52,** May pp. 234-240. [Summary in English.] **487**

The preparation of antigens from *Echinococcus, Fasciola hepatica, Ascaris lumbricoides,* and *Muellerius capillaris* is described. Rabbits inoculated i/v with these antigens every third day for 30 days developed specific antibodies. Good results were obtained in precipitation, c.f. and allergic tests with these antigens in infested sheep and cattle, positive reactions occurring in 89–96% of sheep with echinococcosis, 85–99% of sheep and cattle with fascioliasis, 72–78% of sheep with ascariasis and 69–87% of sheep with muellerius infestation. Uninfested animals were all negative.

—M.G.G.

Mayhew, R. L. (1959). **Immunity to Cooperia punctata and Oesophagostomum radiatum in cattle.**—J. Parasit. **45,** No. 4 Sect. 2 p. 44. [Author's abst. modified.] **488**

Immunity to *C. punctata* developed in 31 experimentally infected cattle. This was first indicated by rapid drop in egg counts, often to zero, followed by a slight increase. Egg counts remained low or continued to be negative. Some individuals did not become definitely immune until a third drop in egg count. After establishment of immunity, no eggs or very few were recovered. Cattle responded to reinoculation by remaining negative or by a temporary and very small increase in egg count. Eleven of 27 animals shown to be immune to *C. punctata* were inoculated with infective larvae of *O. radiatum* and all were susceptible to this species.

I. Baker, N. F., Allen, P. H. & Douglas, J. R. (1959). **Trial with a new organic phosphate as an anthelmintic in cattle.**—Amer. J. vet. Res. **20,** 278-280. **489**

II. Douglas, J. R., Baker, N. F. & Allen, P. H. (1959). **Trial with a new organic phosphate**

**as an anthelmintic in sheep.** — Ibid. 442-444. [Authors' summaries modified.] **490**

III. Landram, J. F. & Shaver, R. J. (1959). **Anthelmintic activity of a new organic phosphate in cattle and sheep.** — J. Parasit. **45,** No. 4 Sect. 2 pp. 55-56. [Authors' abst. modified.] **491**

I. "Dowco 105" [*O*-methyl *O*-(4 tert-butyl-2-chlorophenyl) ethyl-phosphoramidothioate] controlled several genera of Trichostrongyloidea in cattle. From 90 to 100% of *Trichostrongylus* spp. in the abomasum and small intestine, as well as 87% of *Cooperia* spp. in the small intestine and 66% of *Ostertagia* spp. in the abomasum were removed by a single dose of 120 to 130 mg. per kg. body wt. The dose caused toxicosis in 5 of 10 animals, but it was severe in only one. No action against adult *Fasciola hepatica* was observed.

II. "Dowco 105" was active against most species of nematodes in the abomasum and small intestine of lambs. A dose of 200 mg./kg. body wt. gave an average anthelmintic efficiency of 93%. When the dose was reduced to 75 mg./kg. anthelmintic efficiency dropped to 55%.

III. The compound 4-tert-butyl-2-chlorophenyl methyl ethylphosphoramidate showed promising anthelmintic activity in preliminary trials on 700 cattle and over 1,000 sheep. Good to excellent anthelmintic activity was obtained at doses of 30–50 mg. per kg. in cattle and 50–125 mg. per kg. in sheep.

Reinecke, R. K. & Schutte, J. A. (1959). **Field trials on some anthelminthics for cattle.**—J. S. Afr. vet. med. Ass. **30,** 125-134. [Authors' summary modified.] **492**

"Neguvon" ("Dipterex", Bayer L13/59) was highly effective against *Cooperia* spp. and probably also against *Bunostomum phlebotomum* at doses of 110 mg./kg. body weight. It was highly efficient against *Haemonchus placei* and *Oesophagostomum radiatum* at 45 mg./kg.

"Asuntol" ("Co-Ral", Bayer 21/199) was safe and effective against *Cooperia* spp., *H. placei* and *Oes. radiatum* at 14 mg./kg.

Toxic symptoms were noted at doses of 150 mg./kg. with "Neguvon" and 30 mg./kg. with "Asuntol".

Wood, I. B., Emro, J., Wallace, W. S. & Waletzky, E. (1959). **The effects of Caricide, diethylcarbamazine, on experimental infections of Haemonchus contortus and Trichostrongylus spp. in lambs.**—J. Parasit. **45,** No. 4 Sect. 2 p. 56. [Authors' abst. modified.] **493**

Single oral doses of 15 mg. per kg. diethylcarbamazine citrate were highly effective in reducing egg counts and adult populations of *H. contortus* in 14 lambs. Higher doses (250 and 500 mg. per kg.) had an action comparable to that of phenothiazine against *Trichostrongylus axei* and *T. colubriformis*. The anthelmintic activity of diethylcarbamazine was not due to its piperazine content, as piperazine has been reported inactive against these nematodes.

Stampa, S. (1959). **The control of internal parasites of sheep with Neguvon and Asuntol. A preliminary report.**—J. S. Afr. vet. med. Ass. **30,** 19-26. [Author's summary modified.] **494**

Neguvon (Dipterex) was very effective against *Haemonchus* and *Nematodirus,* possibly also against *Oesophagostomum* as judged by the reduction of eggs voided after a single dose. Asuntol (Bayer 21/199) was very effective against *Haemonchus, Ostertagia, Trichostrongylus, Nematodirus, Oesophagostomum* and *Stronglyloides.*

The effect of Neguvon was greatly enhanced by predosing with copper sulphate, but that of Asuntol was not.

A mixture of 10 parts Neguvon to 1 part Asuntol when given after copper sulphate, gave similar results to Asuntol alone except that the action against *Strongyloides* was not as satisfactory.

Non-intestinal parasites such as *Oestrus ovis, Chrysomyia* larvae and *Dictyocaulus filaria* were also killed by the dosing.

An effective dose of the mixture was 50 to 60 mg./kg. body weight. 2,152 sheep in the Karroo were dosed with from 50–90 mg./kg. without producing any visible clinical symptoms. A dose of 110 mg./kg. caused one death in 50 sheep. Higher doses were also tested.

Angora goats in the Karroo and sheep in the winter rainfall area were more susceptible than Karroo sheep.

*See also absts.* **419** (helminths and swine fever); **543-544** (tin arsenate anthelmintic for sheep); **580** (grazing of sheep in relation to helminths).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Jacob, K. (1959). Grosshirnmeningom beim Hund. **[Cerebral meningioma in dogs.]**—Berl. Münch. tierärztl. Wschr. **72,** 226-228. [Summary in English.] **495**

This is stated to be the tenth recorded account of a meningeal tumour in the dog. Eight of those recorded previously occurred on the cerebellum and only one on the cerebrum. The one described here was in an 11-year-old male Pomeranian. Symptoms included restlessness, epileptiform convulsions, screaming fits, were spread over 3 months, starting mildly and becoming extreme until euthanasia. The tumour was a solitary cytoplastic, dural meningioma of the cerebrum. Pathology and histology are described and photographs and photomicrographs appended.

—Irene M. Dixon.

Jacob, K. & Scheunemann, H. (1959). Zur Kasuistik metastatischer Hirntumoren beim Hund. **[Metastatic brain tumours in dogs.]** —Kleintier-Praxis **4,** 28-33. [Summaries in English and French.] **496**

Multiple metastases of an angioblastic sarcoma in the brain of an 11-year-old dog are described. Symptoms included progressively: cough, shaking of head and ears, locomotor interference and ataxia, crying and restlessness. The primary tumour was in the lungs. There was oedema enclosing many soft spongy areas containing gelatinous blood. Areas did not exceed the size of a pea. Renal cortex and thyroid gland were also involved. Findings in the brain including slight oedema, medium hyperaemia, and tumours mainly in the cerebral cortex. Details of pathology and histology are given with photographs and photomicrographs.—Irene M. Dixon.

Verwer, M. A. J. (1959). Het klinische beeld van honden, lijdende aan intracraniële tumor. **[Clinical features of intracranial tumours in dogs.]** — Tijdschr. Diergeneesk. **84,** 1165-1174. [In Dutch. Summaries in English, French and German. English summary modified.] **497**

In 21 dogs with intracranial tumours psychic changes and changes in habit were prominent. Depression was more prevalent than excitement and ataxia more than paresis. 16 adopted abnormal posture of the head. In 13 of 17 cases the cerebrospinal fluid was abnormal; the main abnormalities were pleocytosis, increased total albumin content, changes in the colloid curves and high pressure before or after Queckenstedt's test (compression of neck veins).

Of the 21 dogs 8 were Boxers. 14 were males and 7 females.

Krollpfeiffer, H. (1959). Beobachtungen bei der Diagnostik der Rinderleukose. **[Diagnosis of leucosis in cattle.]** — Dtsch. tierärztl. Wschr. **66,** 246-247. [Summary in English.] **498**

In 30 cattle with a white blood cell picture positive or doubtful for leucosis but with no swelling of the superficial lymph nodes, P.M. examination revealed leucotic changes of the internal organs, and in 15 swelling of the visceral lymph nodes.—M.G.G.

Bendixen, H. J. (1959). Sur les manifestations, au Danemark, de la leucose des bovidés et sur la valeur diagnostique des examens hématologiques. **[Bovine leucosis in Denmark.]**—Bull. Off. int. Epiz. **52,** May pp. 282-293. [Summary in English.] **499**

Leucosis occurs in about 400 Danish herds, 70 of which furnish 80–85% of the annual number of cases; in the other herds only single cases appear and the leucocyte picture of the remaining cattle is normal. Preventive measures should include prohibition of the sale of breeding cattle and of the dissemination of infected raw milk and semen, and prevention of contact infection at pasture, exhibitions etc. A possible method of control now being tried, other than slaughter of the whole herd, is to cull the cattle with a positive leucocyte picture and to rear the calves of negative cattle away from the herd.—M.G.G.

## NUTRITIONAL AND METABOLIC DISORDERS

Castle, M. E. & Walker, R. F. R. (1959). **The outdoor rearing of Ayrshire calves on pasture with and without supplementary feeding.** — J. Brit. Grassl. Soc. **14,** 88-93. [Authors' summary modified.] **500**

Twenty-four bull calves were put on pasture at 2 weeks of age and received an average of 37 gal. of whole milk until weaned at 8 weeks old. Twelve received no supplementary feeding, but the other twelve each ate

257 lb. of a meal containing oats, linseed cake, flaked maize and fish meal from their 3rd to their 20th week.

The mean daily weight gains from birth to 20 weeks were 1·05 lb. for the unsupplemented and 1·14 lb. for the supplemented calves—a non-significant difference, as was also the difference between the mean increases in belly-girth measurements of the two groups.

Parasitic infestation was extremely low in both groups and 83% of all faeces samples examined contained no worm eggs.

Garner, R. J. & Sansom, B. F. (1959). **Transfer of iodine-131 and strontium-89 from diet to milk in cattle.** — Vet. Rec. **71,** 670-673. [Authors' summary modified.] **501**

From 0·17 to 3·9% (mean 0·81%) of carrier-free $^{89}$Sr and from 1·3 to 13·1% (mean 5%) of carrier-free $^{131}$I can be recovered from the milk of cows during the 6 days following a single oral dose. Variations in recovery of Sr can be accounted for by differences in milk yield. The factors controlling the secretion of I into milk are not fully understood.

McClure, T. J. (1959). **Temporary nutritional stress and infertility in female mice.**—J. Physiol. **147,** 221-225. [Author's summary.] **502**

Complete starvation of mice for periods of 48 hr. at various times during early pregnancy caused infertility. This effect was partly relieved by feeding carbohydrate during the periods when the normal food was withheld.

Campbell, R. S. F., Church, G., Dick, M., Lawrie, T. D. V., Pirrie, R. & Watson, W. C. (1959). **The effect of epi-oestradiol benzoate on cholesterol induced atherosclerosis in the chicken.**—Brit. J. exp. Path. **40,** 338-342. **503**

The authors fed Golden Legbar-Light Sussex cockerels on a cholesterol diet to produce atherosclerosis. Even large doses of epi-oestradiol produced no improvement in coronary or aortic atheroma.—R.M.

Kemp, A. (1959). Enkele waarnemingen over het natriumgehalte van weidegras in verband met het magnesiumgehalte van het bloedserum bij melkkoeien. **[Sodium content of herbage in relation to magnesium content of serum in grazing milch cows.]** Jaarboek 1959, Instituut voor Biologisch en Scheikundig Onderzoek van Landbouwgewassen, Wageningen. pp. 163-167. [Summary in English.] **504**

Although the sodium content of herbage on "tetany-prone pastures" was low, increasing the sodium content by dressing with Chilean nitrate did not prevent hypomagnesaemia in cattle grazing the pastures.—R.M.

Reinders, J. S. (1959). Hypomagnesiaemie en voeding. **[Hypomagnesaemia and feeding.]** — Tijdschr. Diergeneesk. **84,** 630-642. [In Dutch. Summaries in English, French and German.] **505**

R. stated that in the Netherlands hypomagnesaemia was seldom a primary Mg deficiency and was most often secondary to nutritional disturbances. It could be prevented by providing correct proportions of protein and starch in the ration, and by suitable treatment of indigestion.—R.M.

Heggeness, F. W. (1959). **Effect of antibiotics on the gastro-intestinal absorption of calcium and magnesium in the rat.**—J. Nutr. **68,** 573-582. [Author's summary modified.] **506**

Rats fed complete diets containing 60% galactose or glucose show greater absorption of calcium when a broad spectrum antibiotic such as neomycin is included in the diet. Absorption of Mg is also increased but that additionally absorbed is excreted in the urine resulting in no overall improvement in utilization. The duration of antibiotic effect appears to be less than one month. Animals ingesting antibiotics had greatly distended caeca, predominantly due to increased water content.

Gebauer, H. & Hamann, K. (1959). Zur Anämie der Ferkel. **[Anaemia in piglets.]**—Tierärztl. Umsch. **14,** 196-200. **507**

Iron preparations were administered orally in trials with over 250 piglets. No difference in effect on clinical appearance, haemoglobin content and growth rate was seen between organic and inorganic iron. It is recommended that piglets receive 100 mg. of iron daily from the 5th day of life. Admixture of cobalt, copper and manganese gave better results than simple iron preparations.—M.G.G.

Gawaz, E. (1958). Beitrag zum sogenannten Zungenspielen des Rindes—Behandlungsversuche mit verschiedenen Mineralsalzgemischen. **[Treatment with mineral mixtures of tongue-wagging in cattle.]**—Inaug. Diss., Hanover pp. 36. **508**

The symptoms of tongue-wagging, observed only in housed cattle, were as follows. Shortly after feeding the animal extends its head and neck, protrudes its tongue as far as possible and thrusts it vigorously to and fro.

The tongue movements, verging on the acrobatic, appear to give great satisfaction to the animal, and may be practised for hours at a time. Incidence was related to soil fertility and season. Only 2 affected animals, out of 950, were seen in districts were the soil is rich in mineral salts, compared with 44 out of 660 cattle in marshy districts with poor soil. 60% of affected animals were young cattle fed on hay of poor quality. Dairy cows were affected after parturition and during heavy lactation. 86% of the affected animals were seen between January and April, the last months of winter feeding, compared with only 3% from April to November and 11% from November to January. Tongue-wagging appeared during and after the war in districts previously free from the affection, when mineral fertilizers were difficult to obtain. All of 37 cattle ceased tongue-wagging after daily supplementation of the ration with mineral mixtures for 2–4 weeks. Recovery was usually more rapid in those given an injection of calcium and vitamin D as well.—M.G.G.

Giroud, A. & Martinet, M. (1959). Extension à plusieurs espèces de mammifères des malformations embryonnaires par hypervitaminose A. [**Malformation of embryos caused by excessive vitamin A in guinea-pigs, rabbits and mice.**]—C. R. Soc. Biol., Paris **153,** 201-202. **509**

Embryo malformation as a result of excessive vitamin A administration to pregnant females has been demonstrated in rats, mice, rabbits and g.pigs. The effects included abortion, embryo resorption, total fissure of lower jaw, microstomy, exencephaly, palatine fissure, intra-ocular haemorrhage, crystalline lens changes, and replacement of brain by angiomatous tissues.—F. R. Paulsen.

Mackenzie, J. B. & Mackenzie, C. G. (1959). **The effect of alpha-tocopherol, alpha-tocopherylhydroquinone and their esters on experimental muscular dystrophy in the rat.**—J. Nutr. **67,** 223-235. [Authors' summary modified.] **510**

Relatively severe muscular dystrophy was produced in rats fed a vitamin E-deficient diet devoid of antioxidants.

Alpha-tocopherol and related compounds were administered daily by i/v injection and the effect on creatine excretion and muscle lesions was determined during 2 weeks.

Both alpha-tocopherol and alpha-tocopherylhydroquinone caused a prompt fall in creatine excretion to the normal level and cured the muscle lesions. Alpha-tocopherol acetate produced a slower fall in creatine excretion and muscle lesions were present at the end of the test period.

Adamesteanu, I. & Adamesteanu, C. (1959). Beitrag zur Enzephalomalazie der Kücken. [**Encephalomalacia in chicks.**] — Mh. VetMed. **14,** 242-245. **511**

An account of the disease as seen in Roumania. There are 5 photomicrographs of brain lesions and 2 of muscle lesions.

—Irene M. Dixon.

Berg, B. N. (1959). **Duodenitis and duodenal ulcers produced in rats by pantothenic acid deficiency.** — Brit. J. exp. Path. **40,** 371-374. **512**

B. found a high incidence of duodenitis and duodenal ulcers when a strain of Mendel-Sherman rats were fed on a pantothenic acid-deficient diet. Duodenitis was produced after 8–12 weeks of this diet in 90% of the animals, with ulceration in 60%. The experiments showed that pantothenic acid was necessary for maintenance of an intact duodenal mucosa and that duodenitis was a precursor of ulcer formation. The possibility that interference with metabolism of the vitamin might be a factor in the production of human duodenal ulceration was discussed.—R.M.

Prinz, W., Hill, H. & Heinrich, H. C. (1959). Über die Resorption von radioaktivem, Comarkierten Vitamin $B_{12}$ und $B_{12}$-ähnlichen Verbindungen bei normalen, gastrektomierten und mit Dünndarmkanülen versehenen Schweinen unter Verwendung von resorptionsbeeinflussenden Faktoren. [**Absorption of cyanocobalamin labelled with radiocobalt in pigs.**]—Zbl. VetMed. **6,** 605-624. [Summaries in English, French and Spanish. English summary modified.] **513**

In normal and gastrectomized pigs and in animals with a duodenal cannula the absorption of labelled cyanocobalamin was studied by measuring the radio activity of urine. Preparations containing the intrinsic factor increased absorption in normal animals but inhibited it when the stomach was short-circuited. Sorbose inhibited absorption. Homologues of the vitamin (benzimidazol, dichlorbenzimidazol, 5-hydroxybenzimidazol) marked with $Co^{60}$, inorganic salts of cobalt, and agents acting like cyanocobalamin were less easily absorbed than the vitamin.

## DISEASES, GENERAL

Chernyak, V. Z. (1957). **[Pathological diagnosis of the infectious diseases of farm animals.]** pp. 287. Moscow & Leningrad: Gosud. izdatel'stvo sel'skokhoz. literatury. 2nd edit. 5r. 90k. [In Russian.] **514**

This little book is designed to assist veterinary surgeons on farms and in abattoirs in post-mortem diagnosis. The first edition was published in 1947. It deals in turn with infectious diseases of horses, cattle, sheep and goats, pigs, dogs, poultry.—R.M.

Zwart, D. (1959). Dierziekten en veeteelt op Nederlands Nieuw-Guinea. **[Animal diseases and husbandry in Dutch New Guinea.]**—Tijdschr. Diergeneesk. **84,** 812-831. [In Dutch. Summaries in English, French and German.] **515**

A survey of infectious diseases and helminth and arthropod parasites, mainly in farm animals and poultry.—R.M.

Brownlee, A. (1959). **Changes in the coeliaco-mesenteric ganglia of horses affected with grass sickness and of horses affected with some other diseases.**—Vet. Rec. **71,** 668-669. [Author's summary modified.] **516**

Changes were found in the coeliaco-mesenteric ganglia of 11 acute and 8 subacute cases of grass sickness in horses.

Changes similar to those found in subacute grass sickness cases were also found in 3 out of 15 control horses.

Large vacuoles similar to those described in the spinal ganglia of normal sheep and rabbits were found in the coeliaco-mesenteric ganglia of 5 horses only 2 of which were grass sickness cases and one was normal.

Appleby, E. C. (1959). **Some observations on the diseases of finches and parrot-like birds kept in aviaries.** — Proc. 1st. Congr. Brit. Small-Anim. vet. Ass., London 1958. pp. 25-30. Discussion: pp. 31-32. **517**

The author gave the correct classification of the usual pet birds; he dealt mainly with the P.M. findings on Passeriformes and Psittaciformes. Extensive tables and diagrams record the P.M. findings in about 750 birds over a 20-year period. Very roughly the main causes of death could be listed thus in descending order of importance: respiratory, alimentary, urinary. Causes of feather trouble are mainly: irritation, diet, boredom.

The possibility of budgerigar-carried poliomyelitis is discussed.—IRENE M. DIXON.

Wichmann, R. W. & Bankowski, R. A. (1959). **Hepatopathies in chickens.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 376-384. **518**

The authors described a number of liver conditions in fowls including avian vibrionic hepatitis, toxic fats hepatopathy, avian infective synovitis, a bluecomb-like syndrome found after treatment with sulphaquinoxaline for coccidiosis, and bluecomb disease; mention was also made of a number of other liver conditions. The gross and microscopic lesions especially of the first two diseases were described and their differentiating features pointed out, as well as those of bluecomb.

—W. K. DUNSCOMBE.

Butozan, V. & Mihajlovic, S. (1959). L'hématurie vésicale chronique des bovins en Yougoslavie. **[Chronic bovine haematuria in Yugoslavia.]**—Bull. Off. int. Epiz. **52,** May pp. 269-281. **519**

A review of the incidence, symptoms and lesions of chronic bovine haematuria in Yugoslavia [see also *V.B.* **9,** p. 32; **26,** 3923; **29,** 206 & 514]. The source of the causal agent is considered to be the food or the soil and the route of entry the digestive tract.—M.G.G.

Chiorboli, A. (1959). L'impiego dell'idrazide isonicotinica e dei sali di calcio nel trattamento di forme broncopolmonari del vitello, resistenti agli antibiotici ed ai sulfamidici. **[Isoniazid and calcium in the treatment of bronchopneumonia in calves.]** — Clin. vet., Milano **82,** 203-205. **520**

C. recommended daily i/p injections of 40–60 ml. of a soln. composed of 5% isoniazid, 20% calcium gluconate and 5% magnesium gluconate. It was stated that treatment was effective in calves which failed to respond to antibiotics.—F. R. PAULSEN.

Auguadra, P. (1958). Grippe o influenza del dromedario somalo. **[Influenza in camels.]** —Arch. ital. Sci. med. trop. Parasit. **39,** 215-222. **521**

The disease, called "Dugato" in Italian Somaliland, affected 4 of 50 camels and later spread to others. Symptoms were fever, dulness, weakness, suspended rumination, cough,

nasal discharge and constipation followed by diarrhoea. Two badly affected camels were killed and the main P.M. finding was catarrhal bronchopneumonia; trypanosomes were not demonstrable in the blood. The rest were divided into 4 groups of 10, and treated with antibiotics or other drugs [composition not given], and a control group of 8 kept under good hygienic and nutritional conditions without treatment. All recovered.—T.E.G.R.

Beeler, D. A., Benson, D. A. & Langille, W. M. (1959). **Mineral analyses of livers and kidneys of moose (Alces americana).**—J. Wildlife Mgmt **23,** 356-358. [Authors' summary modified.] **522**

Quantitative spectrographic and colorimetric analyses of liver and kidney tissues of 16 moose from Nova Scotia with "moose sickness" [*V.B.* **29,** 210] and 10 healthy moose from Newfoundland for the elements Co, Cu, Mo and Zn resulted in the conclusion that the moose in both provinces take and store similar quantities of these elements except cobalt: liver from moose in Nova Scotia had a higher content of Co. There was no evidence of mineral imbalance in "moose sickness".

Schlaaff, S. (1959). Zur Urolithiasis bei Hund und Katze. **[Urinary calculi in dog and cat treated with hyaluronidase.]**—Berl. Münch. tierärztl. Wschr. **72,** 121-126. [Summary in English.] **523**

The interaction of hyaluronic acid, chondroitin-sulphuric acid and hyaluronidase in intercellular exchange is discussed and it is concluded that hyaluronidase causes mucinolysis, reduced viscosity and therefore greater permeability of the intracellular substance.

Urine with low surface tension seems far less liable to calculus formation. The decreased calculus formation following hyaluronidase therapy is not thought to be due to direct action on urine but rather to the increased excretion of hyaluronic acid and the increase of protective colloids.

Twenty cases in cats and dogs are described, in most of which, injected hyaluronidase rendered surgical interference unnecessary in partial blockages. X-ray plates are included.—Irene M. Dixon.

Siller, W. G. (1959). **The pathology of avian glomerulonephritis.**—J. Path. Bact. **78,** 57-65. [Author's summary modified.] **524**

In 486 P.M. examinations on fowls there were 145 cases of nephritic disease including 31 of glomerulonephritis. Histologically the acute glomerular lesions were similar to those of mammalian acute diffuse proliferative glomerulonephritis, while the chronic lesions were comparable to the human subacute form. Tubular changes and clinical symptoms were slight: these differences from the human disease may be due to the lesser tendency to fibrosis seen in fowl tissues generally, and to the renal portal blood-supply which permits tubular function to occur in the presence of glomerular damage. This condition did not appear to have been described previously in the fowl. The aetiology is unknown.

Tyler, C. & Simkiss, K. (1959). **Studies on egg shells. XI. Some abnormalities.**—J. Sci. Fd Agric. **10,** 362-366. [Authors' abst. modified.] **525**

Various concretions and irregularities on hen egg shells were studied. The abnormalities may arise because excessive quantities of membrane, matrix or cuticular material have been deposited during some stage of shell formation. These deposits may or may not affect the general structure of the rest of the shell, but if they do, pseudo-mammillae and/or internal cuticles may be formed.

Schultze, M. O., Perman, V., Mizuno, N. S., Bates, F. W., Sautter, J. H., Isbin, H. S. & Loken, M. K. (1959). **Effects of gamma radiation on calves.**—Radiation Res. **11,** 399-408. [Authors' summary modified.] **526**

Twenty-seven calves were placed in wooden crates and exposed to gamma rays from cobalt-60 at about 6·6 r per min. until they had received 150 to 360 r. Twenty-six developed acute hypoplasia of the bone marrow and a haemorrhagic syndrome and died after 14 to 24 days. One exposed to 350 r developed an acute intestinal radiation syndrome and died on the fifth day.

Two calves exposed to 150 r developed a severe blood dyscrasia between the 20th and 30th day, from which they recovered. They appeared to be normal by 270 days.

The sequence and extent of changes in blood cells were essentially the same as those described in other mammals.

I. Trum, B. F., Lane, J. J., Kuhn, U. S. G. & Rust, J. H. (1959). **The mortality response of the burro (Equus asinus) to a single total-body exposure of gamma radiations from $Zr^{95}/Nb^{95}$.**—Radiation Res. **11,** 314-325. **527**

II. Trum, B. F., Shively, J. N., Kuhn, U. S. G. & Carll, W. T. (1959). **Radiation injury and recovery in swine.** — Ibid. 326-342. 528

I. 50 donkeys were exposed to gamma rays from a mixture of zirconium-95 and niobium-95 oxides in a capsule placed a metre above ground level in a paddock. They received between 500 and 900 r at 15 r hour. The average lethal dose was 585 r and most deaths occurred 22–34 days after exposure. Haematological changes and changes in uptake of radioiodine by the thyroid were recorded. Results were compared with those obtained from cobalt-60 and tantalum-182.

II. 50 young pigs exposed to an initial dose of ionizing radiation were allowed 90 days of recuperation and then subjected to 50 r of gamma-radiation daily until death.

They lived for from 83 to 385 days after irradiation began. Mean survival times were related to size of the initial irradiation.

Lymphatic leucaemia occurred in one pig. Other clinical, haematological, and pathological changes were noted. Pigs survived much longer than donkeys exposed to similar doses of radiation.—R.M.

Mraz, F. R. (1959). **Influence of dietary potassium and sodium on cesium-134 and potassium-42 excretion in sheep.** — J. Nutr. **68,** 655-662. [Author's summary modified.] 529

Forty-eight yearling wethers were used to test the metabolism of orally administered potassium-42 and caesium-134.

Dietary K significantly increased excretion of both isotopes in either the presence or absence of dietary Na. Sodium did not appreciably affect excretion of the isotopes in the absence of dietary K but did change the excretory pattern in the presence of K. These results demonstrated that caesium excretion can be significantly increased by altering ration constituents. These findings may be important in increasing the excretion of fission products consumed accidentally.

I. Finkel, M. P., Flynn, R. J. & Boskis, B. O. (1959). **Pathologic consequences of $Sr^{90}$ in growing beagles: Interim observations.** — Radiation Res. **11,** 443. 530

II. Rehfeld, C. E. (1959). **Toxic effects of $Ra^{226}$ on beagle dogs given burdens 1620 times the human maximum permissible level.**— Ibid. 463. 531

I. 19 beagles were born 2½ years ago with body burdens of 1·6 to 51·7 $\mu$c $Sr^{90}$ acquired in the uterus as a result of a single i/v injection of the dams 1 to 8 days before parturition. Dogs that contained more than 25 $\mu$c at birth showed some skeletal abnormality, and several developed fractures. Another lot of 34 beagles received, or are receiving, s/c injections of 0·58 or 5·8 $\mu$c for 5 days a week since birth. Pathological effects of the higher dosage include blood disorders, abnormal skeletal development, multiple fractures, and osteogenic sarcomas.

II. Adult beagles given an average of 10·4 $\mu$c/kg. of radium-226 in one i/v inj. maintained normal appetite and digestion for an average of 34 months. Eight of the ten dogs developed bone tumours, and survived an average of 37 months. Tumour formation as revealed by symptoms or radiology first occurred at an average of 35 months after injection. In most cases there were additional skeletal abnormalities and an increased rate of tooth loss. In addition there was depigmentation of the iris and destruction of the tapetum lucidum.—R.M.

## POISONS AND POISONING

Killick, E. M. & Marchant, J. V. (1959). **Resuscitation of dogs from severe acute carbon monoxide poisoning.**—J. Physiol. **147,** 274-298. [Authors' summary modified.] 532

Dogs were exposed to air containing 0·2–0·3% carbon monoxide until they appeared to be near respiratory failure. They were then allowed to breathe air, or oxygen, or 5% carbon dioxide in oxygen.

Loss of carbon monoxide from the blood, and its elimination in expired air were much slower when air was breathed.

Loss of carbon monoxide from the blood was significantly faster when oxygen plus $CO_2$ was breathed than with oxygen alone.

I. Weatherell, J. A. & Weidmann, S. M. (1959). **The skeletal changes of chronic experimental fluorosis.** — J. Path. Bact. **78,** 233-241. 533

II. Weidmann, S. M. & Weatherell, J. A. (1959). **The uptake and distribution of fluorine in bones.**—Ibid. 243-255. [Authors' summaries modified.] 534

I. The gross and microscopic features of skeletal fluorosis in sheep and rabbits to which sodium fluoride had been administered are described.

Considerable haphazard exostoses developed upon mandibular and long bones. Newly-formed bone was histologically similar to normal coarsely-bundled woven bone found in the foetus. Exostoses were usually less calcified than normal and nowhere was there evidence of hypermineralization. Resorption was a marked but not invariable feature of fluorotic bone. The presence of wide seams of osteoid in sheep exostoses suggested defective mechanism of calcification.

II. Fluorine administered as NaF in drinking water was incorporated more readily into active areas of bone growth than into static regions. Uptake was greater in young bones than in mature bones. The cancellous parts of the shaft incorporated fluorine faster than the cortical (compact) parts, and the surface regions of the shaft, both endosteal and periosteal, of adult animals acquired more F than the middle regions.

Particularly high affinity for F was found in bones that tend to form exostoses, such as the periosteal surface of the shaft of long bones in rabbits and sheep and the mandibles of rabbits.

Both F and radiophosphorus were incorporated comparatively rapidly into active areas of bone.

Cohrs, P. & Trautwein, G. (1959). Experimentelle Untersuchungen über die Wirkung von Zementstaub auf Tiere. **[Experimental studies on the action of cement dust on animals.]**—Arch. exp. VetMed. **13**, 403-421. **535**

17 yearling ewes and 2 yearling cattle were fed or made to inhale dust from chimneys of a cement factory. Analysis showed the dust to be composed of 34% CaO, 20% $CO_2$, 14% $SiO_2$; 6% each of $Al_2O_3$, $K_2O$ and $SO_3$; 20% of MgO and of $Fe_2O_3$; 1% $Na_2O$; traces of manganese and chromic oxides; no fluoride. Amounts fed were 2, 5, 11 or 33 g. daily for up to 3 months. No signs of ill health or loss of body weight were observed. Two sheep were placed for 10 min. twice daily for 9 months in a small room containing a thick suspension of dust made by dispersing into the air 200 g. of dust on each occasion. Single doses of 200 mg. of dust were introduced directly into the trachea of 16 rabbits. Inhalation of large amounts of dust caused coughing and catarrh of the respiratory tract but did not change the general condition of the animals. Histological examination of lungs revealed that dust particles were disposed of in the normal way and they caused no fibrosis in lung tissue or other lesions. The results confirmed the findings of Schott (1928) and Jötten & Kortmann (1929), who exposed rabbits to cement dust and found no harmful effect.—R.M.

Dalgaard-Mikkelsen, S., Rasmussen, F. & Simonsen, I. M. (1959). Om toksiciteten af ukrudtbekaempelsesmidlet 2-metyl-4-klorfenoxyacetat for kvaeg. **[Toxicity for cattle of the weed-killer 2-methyl-4-chlorphenoxyacetate.]**—Nord. VetMed. **11**, 469-474. [In Danish. Summaries in English and German. English summary modified.] **536**

In 4 heifers grazing for 8 days a field sprayed with 1 kg. of MCPA per hectare no symptoms of poisoning were observed.

Daily oral administration for 3 weeks of 2 g. and 10 g. of MCPA to heifers (approx. 6 and 30 mg./kg. body wt.) did not affect general health and did not influence the rumen flora as judged by pH of the rumen fluid, total contents of volatile fatty acids and glucolytic activity.

I. Simon, J., Sund, J. M., Douglas, F. D., Wright, M. J. & Kowalczyk, T. (1959). **The effect of nitrite when placed in the rumens of pregnant dairy cattle.**—J. Amer. vet. med. Ass. **135**, 311-314. **537**

II. Simon, J., Sund, J. M., Wright, M. J. & Douglas, F. D. (1959). **Prevention of non-infectious abortion in cattle by weed control and fertilization practices on lowland pastures.**—Ibid. 315-317. [Authors' summaries modified.] **538**

I. No abortions occurred in three trials when small doses of $KNO_3$ or $NaNO_2$ were given to cattle. Lesions on the foetal membranes, however suggested that abortions might have occurred at higher dosages.

In the fourth trial, 9 heifers were given $KNO_3$ daily through a rumen fistula. The 3 given 140 g. daily died after the second dose; the 3 given 100 g. daily aborted after 3, 5 and 13 doses, respectively, and the 3 given 70 g. daily for about 47 days calved at the normal time but one calf was small (20 lb.) and weak.

The variation in levels of methaemoglobin within groups and in individual animals on different days was so great that it had little value for detecting nitrate intoxication.

Lesions on the foetuses and foetal membranes of the 3 heifers which aborted were comparable to those observed in naturally occurring marshland abortions.

Nitrates present in weeds are involved in the marshland abortion syndrome, although their specific mode of action remains undetermined.

II. Non-infectious abortions on lowland pastures are associated with the prevalence of weeds. Eradication of the weeds prevented this type of abortion. Ten heifers grazing on weed-free areas all calved normally, whereas 17 grazing on weedy areas aborted.

It sometimes took two successive years of spraying to eradicate the weeds.

Fertilization of these areas benefited the growth of bluegrass and other grasses.

The lack of tonus of the uterine wall and the loss of intensity of the artery pulsation may be useful in predicting an impending abortion, but methaemoglobin determinations were not helpful, the levels varying widely. The relationship of abortion to nitrate content of the weeds is discussed. The pathogenesis of this condition requires further study.

Dybing, O. & Erichsen, S. (1959). **Liver changes in rats after administration of Senecio aquaticus.**—Acta path. microbiol. scand. **47**, 1-8. [In English. Authors' summary modified.] 539

Male rats fed on a diet containing 1% dried senecio died after 7–9 months with severe liver lesions. The histological picture comprised megalocytosis, degeneration and necrosis of the polygonal liver cells as well as neoplasia of these cells.

Fraser, C. M. & Nelson, J. (1959). **Sweet clover poisoning in newborn calves.** — J. Amer. vet. med. Ass. **135**, 283-286. 540

A condition is described in which apparently normal calves died of a haemorrhagic diathesis within a few hours of birth; the dams and the rest of the herd were unaffected. The condition is believed to have been sweet clover disease. [The evidence in support of this diagnosis is not very convincing.]

Fairbairn, J. W. & Challen, S. B. (1959). **The alkaloids of hemlock (Conium maculatum L.). Distribution in relation to the development of the fruit.** — Biochem. J. **72**, 556-561. 541

The average weight of the fruits and amount of alkaloids in a sunny season was twice that of a wet season. It was suggested that gamma-coniceine and other piperideines are the precursors of the saturated alkaloids such as coniine and conhydrine and this change is associated with active growth. The change may be reversible.—R.M.

Bergner, A. D. (1959). **Histochemical detection of fatal anticholinesterase poisoning. II. Reactivation of cholinesterase in cadavers of rats.**—Amer. J. Path. **35**, 807-817. 542

In rats poisoned with diazinon, parathion or other cholinesterase-inhibiting compounds, cholinesterase activity in muscle was still inhibited 2 hours after death but in muscle removed 24 hours after death it could be demonstrated histochemically by the copper thiocholine test. Inhibition of the enzyme was abolished by immersing muscle in a solution of an oxime ("TMB4" or "2-PAM") before applying the copper thiocholine test. In suspected cases of poisoning it was recommended that a sample of teased muscle should be divided into two parts. One part was treated with an oxime in order to demonstrate the site of cholinesterase activity and the other part was tested for inhibition of activity, if any. —R.M.

I. Gelovani, D. M., Beritashvili, T. P. & Leonidze, L. A. (1958). **[Toxicity and general action of tin arsenate in sheep.]** — Sborn. Trud. Gruzin. zootekh.-vet. Inst. **10**, 171-176. [In Russian.] 543

II. Mamatelashvili, V. G., Abramishvili, E. S. Makhashvili, A. S. & Beritashvili, K. P. (1958). **[Pathological changes in lambs poisoned with tin arsenate.]**—Ibid. 233-241. [In Russian.] 544

I. & II. Doses within anthelmintic range (up to 0·05 g./kg. body weight) were not toxic for sheep aged 3–4 months. The minimum lethal dose was between 0·11 and 0·13 g./kg. It was safe to give normal well-fed lambs 3 doses each of 0·3 or 0·4 g. at intervals of 10 days.—R.M.

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Linman, J. W., Long, M. J., Korst, D. R. & Bethell, F. H. (1959). **Studies on the stimulation of hemopoiesis by batyl alcohol.**—J. Lab. clin. Med. **54**, 335-343. 545

Batyl alcohol given by mouth induced erythrocytosis, due to the production of microcytes, together with reticulocytosis, thrombocytosis, leucocytosis, and hyperplasia

of all myeloid elements in rats. The erythrocytic response was not associated with increased haemoglobin or haematocrit levels. Incorporation of iron in haemoglobin was not enhanced. [See also *V.B.* **29,** 1231.]—R.M.

Waddell, A. W. (1959). **Observations on the excretion of phenothiazine and oxidation products in sheep and rabbits.** — Arch. int. Pharmacodyn. **121,** 368-379. **546**

Methods for estimating phenothiazine were devised that gave mean recoveries of 87% in faeces and 62% in urine. Methods were also devised for estimating its derivatives in faeces and urine. A mean of 25% (range 8 to 44%) of the total amount of the drug given to sheep was recovered in faeces in 4–5 days. Individual sheep were dosed with thionol, phenothiazone and phenothiazine-sulphoxide. The proportions of these compounds recovered from excreta were 23, 24 and 46% respectively. In rabbits dosed with phenothiazine 23% was recovered from excreta as phenothiazine and 24% as phenothiazone.—R.M.

Morgan, P. J. (1959). **A method for the rapid detection of small concentrations of organic bases in urine.** — Analyst **84,** 418-422. [Author's summary modified.] **547**

A method is described for rapidly detecting small amounts of organic bases in biological fluids. It is specially suited to the use of paper-chromatographic methods of identification. Some results of experiments with several drugs used for doping horses are given.

Oyaert, W. & Bouckaert, J. H. (1959). **Action of penicillin, chloral hydrate and chlorate on some metabolic aspects of ruminal flora.**—Zbl. VetMed. **6,** 693-703. [In English. Summaries in French, German and Spanish. Authors' summary modified.] **548**

Penicillin and chloral hydrate inhibited fermentation of glucose and other monosaccharides. Deamination of amino-acids was also inhibited.

Doses of penicillin higher than 20,000 units in sheep and 20,000 units in cattle provoked anorexia and diarrhoea.

Neither amylolysis nor proteolysis was affected by penicillin or chloral hydrate, but after administration of chloral hydrate the amylolytic activity of ruminal liquid increased

Chlorate and chloral hydrate inhibited breakdown of lactate.

Wilkins, J. R. (1959). **In vitro studies on increased antibacterial activity of neomycin in the presence of certain steroids.**—Antibiot. & Chemother. **9,** 464-469. [Summary in Spanish pp. 509-510. Author's summary modified.] **549**

Action of neomycin against micrococci and streptococci was increased by the free alcohol and hemisuccinate sodium esters of cortisone, hydrocortisone, and delta-1 hydrocortisone. The acetates of these compounds were ineffective. It required at least 1 mg./ml. of steroid to increase neomycin activity significantly and the addition of hydrocortisone 21-hemisuccinate sodium to a bacteriostatic amount of neomycin produced a bactericidal effect. Alone, this steroid temporarily suppressed the growth of *Micrococcus pyogenes* var. *aureus*.

Geroff, K. J. (1959). Über die Wirkung des Novocains bei den Haustieren. I. Behandlung von Diarrhöen bei Ferkeln und Kälbern mit Novocain. **[Action of procaine in domestic animals. I. Treatment of diarrhoea in piglets and calves.]**—Mh. VetMed. **14,** 225-229. **550**

Good and rapid results were claimed for treatment of diarrhoea in 158 calves and 1,600 piglets by i/p inj. of 0·5% or 1% procaine soln. at 6–15 mg./kg. body wt. Up to 3 doses were given at intervals of 24 hours. Addition of penicillin to the injection increased the proportion of recoveries to 91·5% for calves and 95% for piglets.—R.M.

Ivy, A. C., Park, G. E. & Dolowy, W. C. (1959). **Therapeutic improvement of canine cataract.**—Vet. Med. **54,** 205-213. **551**

Twenty-seven dogs with cataract involving 48 eyes were injected with a protein-free extract of serum from horses injected with a lysed culture of *Actinomyces bovis*. This was expected to act in the way of a 'local hormone' or autacoid. Doses were 0·02–0.04 mg. i/m every 2 weeks over several months. The extract is non-toxic. A variable amount of clearing of the cataract occurred in most eyes in about 10–14 weeks, depending on age of lesion. Glaucoma may possibly contra-indicate treatment. 12% of lenses seemed to have returned almost to normal. Detailed tables are attached.—Irene M. Dixon.

Therstappen, H. (1958). Untersuchungen über Verträglichkeit, Dosierung, Wirkung und Anwendungsbereich des Phenothiazinderivats "Megaphen-Bayer" beim Rind. **[Dosage, action and uses of chlorpromazine in cattle.]**—Inaug. Diss. Hanover pp. 51. **552**

The effects of chlorpromazine in 111 cattle are tabulated. I/m and i/v doses were well tolerated, but s/c injections caused persistent, painful swellings. The most suitable dosage appeared to be between 0·5 and 1·5 mg./kg. body wt. The full effect of i/v application appeared after 5 min., and of i/m after 30 min. It lasted at least 3 hours. The drug is particularly suitable for calming excited and refractory animals and in minor operations, when it can be used in combination with local anaesthetics. It is useful in the symptomatic treatment of hypersensitivity conditions. —M.G.G.

Brockmann, F. (1959). Die Behandlung bösartiger Mutterschweine mit Combelen. [**"Combelen" for vicious parturient sows.**] —Vet.-med. Nachr. No. 1 pp. 31-32. **553**

Sows that were unwilling to accept and suckle their piglets responded in 5–10 min. to an i/v inj. of "Combelen" [N(3-dimethylaminopropyl)-3-propionyl phenothiazine phosphate]; even a vicious sow which had been muzzled and chained became quiet in 5 min. and accepted and suckled her 8 piglets, and all were reared without losses. By i/m inj. the drug was also effective but acted more slowly (20–30 min.) There were no complications and in no case was a lactation stimulant required.—F.E.W.

Post, G. (1959). **The use of curare and curare-like drugs on elk (wapiti).** — J. Wildlife Mgmt **23,** 365-366. **554**

Gallamine triethiodide ("Flaxedil") was administered by i/m inj. to 4 captive elk each weighing about 100 kg. A dose of 0·5 mg./kg. body weight (total dose 40–60 mg.) caused paralysis within 3–7 min. which lasted for about 30 min. Dimethyl tubocurarine iodide (Metubine iodide) and tubocurarine chloride were unsatisfactory because the onset of action was too slow and the duration too long. —R.M.

Pistey, W. R. & Wright, J. F. (1959). **Immobilization of captive wild animals.** — Vet. Med. **54,** 446-449. **555**

Succinylcholine chloride was used to produce temporary paralysis in five captive animals: lion, tiger, deer, eland and zebu bull. The drug was administered by an automatic projectile syringe shot from a rifle. The lion (body weight about 200 lb.) and the bull (1,020 lb.) required several doses of the drug before paralysis occurred: total dosage was 52 and 55 mg. respectively. Paralysis lasted for between 4 and 20 min.—R.M.

Pöpsel, G. (1958). Prüfung einiger neuer Lokalanästhetika am Rinde. [**Tests of six new local anaesthetics in cattle.**] — Inaug. Diss., Hanover pp. 68. **556**

Cattle were subjected to epidural, block, and subcutaneous infiltration anaesthesia with 6 local anaesthetics. Three of these were particularly promising; in duration and depth of the anaesthesia they were equal to "Tutocain" [butamin hydrochloride] and in rapidity they were better. They were lignocaine; "Hostacain" [see *V.B.* **29,** 846]; and "Hi 1107" [2 - (β - dimethylaminoethoxy) - 3 - methyl - benzoic acid - methylester hydro - chloride]. No side effects were seen.—M.G.G.

Schleiter, H. & Gruhle, J. (1959). Chlorprocain—ein neues Lokalanästhetikum in der Grosstierchirurgie. [**Chloroprocaine as a local anaesthetic in large-animal surgery.**]—Mh. VetMed. **14,** 376-378. **557**

Chloroprocaine hydrochloride is more potent than procaine and its long effectiveness fits it for major operations. Action generally commences 1 min. after injection, and lasts for 60–90 min., or 120–180 min. if accompanied by 0·003% of adrenaline.—F. R. Paulsen.

Fritsch, R. (1959). Die Steroid-Narkose, Versuche und klinische Erfahrungen mit der "Presuren"-Narkose bei Tieren. [**Trials with the steroid anaesthetic hydroxydione sodium succinate in horses, dogs and cats.**] — Zbl. VetMed. **6,** 162-179. [Summaries in English, French and Spanish.] **558**

This is a new type of intravenous anaesthetic and the compound is also known as "Presuren" and "Viadril". It has been used in human medicine [*V.B.* **29,** 1978]. F. used it in 92 dogs at 30–40 mg./kg. body weight and found that anaesthesia lasted 30–60 min., or about an hour when "Polamivet" (methadone) was injected i/m 2 hours before the anaesthetic. The main disadvantage of hydroxydione was that it tended to cause thrombosis in the vein used for injection. Another disadvantage was its high price, which together with severe respiratory depression and slow recovery precluded its use in horses. Because of its irritant action hydroxydione was unsuitable for cats as struggling during intravenous injection often caused leakage of anaesthetic into tissue surrounding the vein.—R.M.

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Schindler, H. (1959). **Summer and winter scrotal skin temperatures of bulls, as compared to temperatures of other body parts.**—Ktavim **8**, Nos. 1-2 pp. 39. [Abst. in Refuah vet. **16**, 43. In English.] **559**

The skin temperatures of the back, abdomen and scrotum in bulls were 4° to 7°C. higher in summer than in winter, but the rectal temp. was only slightly higher in summer. Reduced fertility in summer and autumn appears to be due to exposure of the scrotum to heat rather than to a rise in body temp.
—M.G.G.

McCay, C. M. (1959). **Chinchillas.**—Lancet September 12th, 350. [Author's communication modified.] **560**

Some of the characteristics of the species are the long gestation period of 111 days in an animal the size of the common white rat; the ease with which this species acquires atherosclerosis when fed small amounts of cholesterol; the long life-span (more than 7 years); their fondness for a diet of dried bread and hay; the mystery of the composition of urine and faeces which makes it an odourless animal; the rat-like tendons in the tails, useful for studying aging of this tissue; and their ability to utilize about half the fibre in their diet while the ordinary rabbit with the same form of gastrointestinal tract can only utilize a third. This suggests differences in the microflora of intestinal tracts that appear alike. When maintained upon ordinary commercial rabbit pellets the urine of the chinchilla may be very clear while that of a rabbit looks like milk.

Gallagher, C. H. & Buttery, S. H. (1959). **Biochemistry of sheep tissues. Enzyme systems of liver, brain and kidney.**—Biochem. J. **72**, 575-582. [Authors' summary modified.] **561**

A number of enzyme systems of sheep liver, brain and kidney have been investigated. Sheep tissues in general have one-third to one-half of the enzymic activities of rat tissues. High liver catalase is the outstanding feature in sheep. Young sheep have lower cytochrome oxidase activity than adults. Liver preparations are unable to catabolize glucose owing to glucokinase deficiency. The significance of this in ruminant metabolism is discussed. The dependence of sheep-liver metabolism upon the oxidation of fatty acids is of possible importance in ruminant diseases.

Lindsay, D. B. (1959). **The significance of carbohydrate in ruminant metabolism.**—Vet. Rev. Annot. **5**, 103-128. **562**

In recent years it has been stated that metabolism of glucose is quantitatively less important in ruminants than in other animals. This review examines reasons for this belief, how far it is true, and some of its implications. Metabolism of fatty acids is also examined because in ruminants some of the functions of carbohydrate are taken over by fatty acids.
—R.M.

Koval'skii, V. V. (1958). **[Labelled atoms in the study of metabolism in farm animals.]** pp. 40. Moscow: Izdatel'stvo Ministerstvo Sel'skogo Khozyaĭstva SSSR. 1r. 25k. **563**

This booklet reviews the use of radioactive isotopes under the following headings: metabolic studies on farm animals in relation to increasing their productivity; mineral metabolism in relation to the prevention of deficiency diseases; study of metabolism during the embryonic period in relation to the rearing of young animals; questions of radioecology. There are 123 references.—R.M.

Mount, L. E. (1959). **The metabolic rate of the new-born pig in relation to environmental temperature and to age.** — J. Physiol. **147**, 333-345. **564**

An account of studies on rectal temperature and oxygen consumption of piglets. Some details have already been published [*V.B.* **29**, 550–551.]—R.M.

Levenson, S. M., Crowley, L. V., Horowitz, R. E. & Malm, O. J. (1959). **The metabolism of carbon-labeled urea in the germfree rat.**—J. biol. Chem. **234**, 2061-2062. **565**

Labelled urea was injected s/c into three germ-free and two normal control rats; urea was given intragastrically to another germ-free rat. The results supported the thesis that enzymic hydrolysis of urea in mammals was effected by urease of their bacteria.—R.M.

Alexander, G. I., Price, D. A., Bogart, R. & Krueger, H. (1959). **Rate and efficiency of gains in beef cattle. VII. Hematology of growing Hereford and Angus calves.**—Tech. Bull. Ore. agric. Exp. Sta. No. 47 pp. 24. [Authors' summary modified.] **566**

Normal values are presented for haemoglobin, haematocrit, red cell count, mean

corpuscular volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, white cell count, lymphocyte, neutrophile, monocyte, eosinophile, and basophile counts. Normal beef calves exhibited wide variations in concentration of the blood constituents studied at both 500 and 800 lb. body weight.

Carr, M. H. & Schloerb, P. R. (1959). **Blood components in the dog: normal values.**—J. Lab. clin. Med. **53**, 646-652. [Authors' summary modified.] 567

There are statistically significant differences between some of the serum electrolytes of dogs and human subjects, but with the exception of sodium and chloride and the protein components, the mean values for the blood components of the dog lie well within the normal range for corresponding components in man.

There is a correlation between the haematocrit and the albumin/globulin ratio, between plasma volume and body weight, and between plasma volume and extracellular fluid volume.

Plasma volume and extracellular fluid volume may be roughly estimated from body weight.

Boguth, W., Habermalz, F. & Schnappauf, H. (1959). Papierelektrophoretische Bestimmung der proteingebundenen Kohlenhydrate im Serum von Haus- und Laboratoriumstieren. I. Mitteilung. **[Paper electrophoresis of protein-bound carbohydrates in serum of domestic and laboratory animals. I.]** — Zbl. Vet-Med. **6**, 634-639. [Summaries in English, French and Spanish.] 568

The authors improved and simplified the method of Köiw & Grönwall (1952) for determining glycoproteins in serum by electrophoresis. Instead of iodated thiosulphate they used an aqueous solution of ascorbic acid for reduction.—R.M.

Prasad, A. S., Flink, E. B. & Zinneman, H. H. (1959). **The base binding property of the serum proteins with respect to magnesium.**—J. Lab. clin. Med. **54**, 357-364. 569

Roughly 10 to 15% of Mg not filtrable through cellophane appeared to be independent of serum proteins.

Alpha-1 globulin appeared to bind some magnesium in multiple myeloma and normal persons, while alpha-2 globulin apparently bound some in all human beings. Beta globulin appeared to bind some magnesium in patients with hypoproteinaemia. In others it did not bind any Mg. Gamma globulin did not bind any Mg.—R.M.

Joysey, V. C. (1959). **The relation between animal and human blood groups.**—Brit. med. Bull. **15**, 158-164. 570

The term "blood group" may be applied to antigens of white cells and platelets as well as red cells and to serum antigens. Blood groups have been discovered in almost all warm-blooded vetebrates. Some investigators consider that the antibodies used to detect blood groups are either naturally occurring (genetic) or immune in origin, whilst others consider them all of immune origin as a result of sensitization through infection with organisms bearing corresponding or closely related antigens. They may be derived from the same species or from a different species of animal from that in which the antigen is demonstrated. Few attempts to correlate the antigens of different species have been made except in the case of the A and B antigens and their variants. The occurrence of these and the blood group patterns in animals and man are reviewed.—A. Ackroyd.

Roberts, J. A. Fraser. (1959). **Some associations between blood groups and disease.** — Brit. med. Bull. **15**, 129-133. 571

The nature and strength of the evidence that there is an association between blood groups and certain diseases in man are reviewed. Statistically significant evidence exists that duodenal (and, probably, gastric) ulceration is commoner in persons of blood Group O whilst cancer of the stomach (and, probably, pernicious anaemia) is commoner in persons of blood Group A.—A. Ackroyd.

Thorbecke, G. J. (1959). **Some histological and functional aspects of lymphoid tissue in germfree animals. I. Morphological studies.** —Ann. N.Y. Acad. Sci. **78**, 237-246. 572

Thorbecke, G. J. & Benacerraf, B. (1959). **Some histological and functional aspects of lymphoid tissue in germfree animals. II. Studies on phagocytosis in vivo.**—Ibid. 247-253. 573

I. Germ-free chickens (aged 2–14 weeks) and adult rats were compared with normal controls. The selected lymphoid tissues were studied for the occurrence of plasma cells and secondary nodules, consisting of mitotic blast cells and phagocytes if active, or reticulum cells, phagocytes and lymphocytes if inactive. Occasionally nodules with bare centres were

found in mammalian lymphoid tissue which were similar to the only type of nodule found in chicken tissue. Up to 6 weeks of age, neither plasma cells nor secondary nodules were seen in the intestinal lymphoid tissue of the germ-free chickens and secondary nodules were absent from the spleen while the numbers of plasma cells were less than in the controls. The serum γ-globulin content of the 2 groups of birds was similar. The thymus showed increasing aggregates of plasma cells after 4 weeks and of nodules after 12 weeks. Both structures were absent from the thymus of rats. The structure of the bursa of Fabricius did not differ in the 2 groups of birds so it was concluded that it was functionally different from lymphoid tissue. There were fairly large differences between the numbers of plasma cells and nodules in the spleen, mesenteric lymph nodes and intestinal mucosa in the 2 groups of rats. Germ-free animals after exposure to a normal environment for 1–4 weeks showed increasing numbers of these structures.

II. The rate of phagocytic activity of the reticulo-endothelial system of a seres of germ-free mice was compared with that of normal mice after i/v inj. of 16 mg. carbon (C)/100 g. body wt. The C clearance curves obtained were similar for both groups although the relative weight of the liver was significantly less in the germ-free mice. Studies after the injection of a heat-killed suspension of *Escherichia coli* labelled with $P^{32}$ demonstrated a greater variation in the clearance rates among the germ-free mice which were slower than those of the controls. Previous immunization with *E. coli* effected great enhancement in both groups. Clearance rates of *Staphylococcus aureus* were similar in both groups. The distribution of radioactivity in the organs and blood was similar in both groups injected with *E. coli* although the germ-free mice immunized with *E. coli* and both groups injected with *Staph. aureus* had a much higher concentration in the liver. Hence the germ-free mice had antibodies against certain bacteria but their defence mechanism usually responded more slowly than normal.—J. E. Hammant.

Van den Hende, C., Oyaert, W. & Bouckaert, J. H. (1959). **Dissimilation of aspartic acid by rumen bacteria.** — Zbl. VetMed. **6,** 681-692. [In English. Summaries in French, German and Spanish. Authors' summary modified.] **574**

Aspartate is attacked by rumen bacteria yielding carbon dioxide, ammonia, propionate and a variable amount of acetate. Fumarate and succinate give the same end-products as aspartate, except for ammonia. From malate and oxalo-acetate larger amounts of acetate are formed, and from pyruvate only acetate is formed.

Fractionated cell-free extracts of rumen bacteria decompose aspartate to fumerate. With acetone-dried bacteria in the presence of aspartate, succinate was the main end-product. Adenosine had a stimulating effect on aspartase activity; with biotin variable results were obtained. Formate inhibited the aspartase of rumen bacteria. A reaction scheme for the breakdown of aspartate by rumen bacteria is given.

Lehman, D., Engel, M. B. & Laskin, D. M. (1959). **Changes in soluble citrate of pigeon bone during egg laying.**—Science **130,** 222-223. [Authors' summary.] **575**

Accompanying the structural changes in medullary bone during the egg-laying cycle there are local increases in the concentration of soluble citrate. Since citrate can form both soluble and insoluble compounds with calcium, it is suggested that this anion may have a regulative function in bone apposition and resorption.

Dawson, F. L. M. (1959). **The normal bovine uterus—physiology, histology and bacteriology.**—Vet. Rev. Annot. **5,** 73-89. **576**

A critical review of the literature, with 86 references.—R.M.

Tata, J. R. & Shellabarger, C. J. (1959). **An explanation for the difference between the responses of mammals and birds to thyroxine and tri-iodothyronine.**—Biochem. J. **72,** 608-613. **577**

Details are given of work previously reported in brief [*V.B.* **29,** 3644].—R.M.

Williams, C. M., Moorhead, L. V. & Pulis, J. F. (1959). **Juvenile hormone in thymus, human placenta and other mammalian organs.**—Nature, Lond. **183,** 405. **578**

A factor indistinguishable from the juvenile hormone of insects was found in mammalian tissue extracts. A 3 : 1 diethyl ether-ethanol solvent was used to extract the tissues, the extract was purified by chromatographing and tested on silkworm pupae. Positive results were obtained with extracts from day-old rats; desiccated pulverized bovine thymus, bone marrow, placenta, ovary, corpus luteum, adrenal cortex, liver, testis, kidney,

spleen; fresh calf thymus and liver; beef tenderloin; fresh human placenta and deep frozen sheep pituitaries. Activity was also found in cream but not in skim milk, lard, wheat germ oil, soya bean, or dried brewer's yeast.—J. E. HAMMANT.

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

*See abstr.* 344 (bacteriological examination of eggs); 366 (necrotic lesions in pork hams).

## LIVESTOCK HYGIENE

Birth, G. S. & Hall, C. W. (1959). **Ventilation of uninsulated steel structures housing livestock.**—Quart. Bull. Mich. agric. Exp. Sta. **42,** 251-261. [Authors' conclusions modified.] 579

Uninsulated steel barns housing cows can be ventilated by natural air movement to eliminate condensation most of the time under Michigan conditions. The temperature difference between the air inlet and air outlet is less than 5°F. Galvanized surfaces covered with oxide paints may cool 10° to 14°F. below the surrounding air as a result of radiant heat loss. Air inlets should be provided on both sides of the building to direct the air along the inside of the roof about the animals.

Roe, R., Southcott, W. H. & Turner, H. N. (1959). **Grazing management of native pastures in the New England region of New South Wales. I. Pasture and sheep production with special reference to systems of grazing and internal parasites.** — Aust. J. agric. Res. **10,** 530-554. [Abst. from authors' summary.] 580

In a 4-year grazing experiment with Merino sheep, on a native pasture dominated by *Bothriochloa ambigua,* three rates of stocking and continuous or rotational grazing were compared. The effects on amount and botanical composition of the pasture and on sheep weights and size, wool production, wool fibre diameter, and parasitic infestation (both with and without drenching with phenothiazine) were studied. Seasonal effects were also recorded.

No consistently significant differences in the pasture or in sheep body weight or parasitic infestation were recorded.

Body weight increased during spring and summer and declined in winter, with the amount of forage available. Wool fibre diameter showed similar seasonal changes, but the maximum diameter was attained earlier than maximum body weight.

Weight gains of the drenched sheep were significantly greater from the late spring to late winter in all stocking treatments. In the spring, when the pasture improved and worm-egg counts were low, drenching had no effect on weight gains in 3 out of 4 years. Drenching improved wool production, and increased the skeletal size of the sheep in 3 out of 4 years.

There was no significant difference in the amount of wool produced per head, but over the 4-year period 56% more wool per acre was produced from the heavy than from the light rate of stocking.

## REPRODUCTION AND REPRODUCTIVE DISORDERS

Netherlands. (1959). Jaarverslag K.I. 1958. Inhoudende het 13e jaarverslag van de centrale commissie van toezicht op de uitvoering van de k.i. in nederland en het 8e jaarverslag van de federatie van provinciale bonden van verenigingen voor k.i. bij rundvee in nederland. **[Annual report on artificial insemination for 1958.]** pp. 71. Utrecht: Centrale Commissie van de K.I. [In Dutch. Summaries in English, French and German.] 581

In the Netherlands during 1958 the number of cows inseminated exceeded one million for the first time (1,026,583). There was slight improvement in conception rate; 61·7% conceived after one insemination. In the province of Utrecht 760 goats were inseminated from 3 males and 70% conceived after first insemination. 327 goats were inseminated at two other centres. A.I. of pigs was tried in 5 provinces on 1,286 sows and gilts and an average of 55% conceived after first insemination: results of individual trials ranged from 28 to 76%.—R.M.

Meryman, H. T. & Kafig, E. (1959). **Survival of spermatozoa following drying.**—Nature, Lond. **184,** Suppl. No. 7. pp. 470-471. 582

Diluted, freshly collected bull semen was

frozen and dried on a sheet of nylon gauze in a glass vessel 4 in. long and 2 in. in diameter. The vessel was connected to a vacuum pump with a free-air pumping speed of 27 cu. ft./min. When reconstituted immediately 40–50% of the spermatozoa were motile and insemination with this semen resulted in fertilization. When reconstituted after storage at room temp. for 1–7 days occasional spermatozoa were motile. Results were improved if the rate of freezing was reduced.—M.G.G.

Chang, M. C. (1959). **Fertilization of rabbit ova in vitro.** — Nature, Lond. **184,** Suppl. No. 7. pp. 466-467. **583**

Of 266 rabbit ova placed in contact with capacitated spermatozoa in Krebs-Ringer bicarbonate soln. for 3–4 hours, then incubated in 50% rabbit serum for 18 hours, 55 cleaved into four cells. 36 were transplanted into the tubes of 6 recipient rabbits, 4 of which bore 15 healthy young.—M.G.G.

Dow, C. (1959). **Experimental reproduction of the cystic hyperplasia-pyometra complex in the bitch.** — J. Path. Bact. **78,** 267-278. [Author's summary modified.] **584**

Cystic hyperplasia of the endometrium was produced in young spayed bitches by prolonged administration of progesterone and by repeated courses of treatment each consisting of 10 daily inj. of 5 mg. stilboestrol followed by 20 daily inj. of 10 mg. progesterone. Acute endometritis was produced by increasing the dose of progesterone from 10 to 50 mg. after 6 consecutive courses or by increasing the dose for each course to 25 mg. daily. Inflammatory lesions regressed when progesterone treatment stopped. Chronic endometritis was produced by similar treatment in bitches in which the horns were isolated from the body of the uterus by ligatures. It was concluded that spontaneous pyometra develops under the influence of excess progesterone.

I. Raeside, J. I. & McDonald, M. F. (1959). **Arborization of cervical mucus in the ewe.**— J. Endocrin. **18,** 350-358. **585**

II. McDonald, M. F. & Raeside, J. I. (1959). **The effect of progesterone and oestrogen on arborization of cervical mucus in the spayed ewe.** — Ibid. 359-365. [Authors' summaries modified.] **586**

I. Crystallization (arborization) of cervical mucus was sometimes detected at irregular intervals in a few anoestrous and pregnant ewes, but it did not appear to be related to cyclic ovarian activity. Mucus collected during the normal oestrous cycle showed crystallization patterns from about 3 days before oestrus until 2 days after. Nearly all animals showed the phenomenon the day before and on the day of oestrus. Prediction of onset of oestrus relative to the first occurrence of arborization was not accurate. In four cycles ovulation without heat was probably detected by the appearance of arborization.

Nearly all ewes showed arborization when given single injections of 100–150 μg. oestradiol benzoate during 115 oestrous cycles on 3–4, 6–7 or 10–12 days after the onset of oestrus.

Crystallization patterns were inhibited when blood, seminal plasma and cellular debris contaminated cervical mucus. The importance of collecting uncontaminated cervical mucus was stressed.

Arborization of cervical mucus appeared to be a better indicator of ovarian activity than arborization of vaginal mucus.

II. Ovariectomized ewes were given 10 mg. progesterone daily for 3 days. They were then injected with varying single doses of oestradiol benzoate. Minimum average doses required to produce oestrus, changes in vaginal smear, and arborization of cervical mucus were 24, 13 and 8 μg. respectively. In experiments conducted during November and December the oestrous response was negligible. During February to May a greater and more consistent response was noted.

The use of vaginal smears and arborization of cervical mucus in quantitative studies with progesterone and oestrogen was considered. Comparison of cervical mucus and vaginal smears collected from ewes treated with a dose of 10 μg. oestradiol showed more distinctive changes in the cervical mucus and easier classification of a response to oestrogen. The difficulty of collecting a satisfactory sample of cervical mucus was discussed.

Martin, L. (1959). **Growth of the vaginal epithelium of the mouse in tissue culture.**— J. Endocrin. **18,** 334-342. [Author's summary modified.] **587**

Pieces of vagina from immature mice were cultured in biological or synthetic media for periods up to 72 hours. Growth and cornification of the epithelium occurred in the absence of oestrogens, and was not prevented by adding a number of hormones and vitamins to the medium. The mechanism of action of oestrogens was discussed.

Bickoff, E. M., Booth, A. N., Livingston, A. L., Hendrickson, A. P. & Lyman, R. L. (1959). **Determination of estrogenic activity in fresh and dried forage.**—J. Anim. Sci. **18,** 1000-1009. [Authors' summary modified.] 588

Since dehydration lowers the oestrogenic activity of a forage, several techniques have been developed for preparation of extracts for bioassay. Freshly harvested forage is rapidly macerated in a blender with acetone to extract the oestrogens. The dried samples are Soxhlet-extracted with acetone for 24 hours. The acetone extract is incorporated into the control diet and the solvent removed.

Oestrogenic activity is evaluated by feeding immature female mice and determining the increase in weight of the uteri.

Emmens, C. W., Cox, R. I. & Martin, L. (1959). **Oestrogen inhibitors of the stilboestrol series.** — J. Endocrin. **18,** 372-380. [Authors' summary.] 589

In tests of vaginal cornification, anti-oestrogenic activity has been demonstrated in dimethyl-stilboestrol, ethylstilboestrol and *n*-propylstilboestrol. It has not been detected in some other stilboestrols.

Dimethylstilboestrol, the most potent anti-oestrogen, inhibits the increase in vaginal mitosis and epithelial thickness which normally follows the administration of oestrone to the ovariectomized mouse. This contrasts with the action of substances like testosterone and progesterone, which inhibit cornification but do not inhibit mitosis in ratios of up to a million to one.

Mitchell, G. E., Jr., Neumann, A. L. & Draper, H. H. (1959). **Metabolism of tritium-labeled diethylstilbestrol by steers.**—J. agric. Food Chem. **7,** 509-512. [Authors' summary modified.] 590

Study was made of the distribution of radioactivity in the tissues and excreta of a bile-fistulated steer after a single oral dose of 10 mg. tritium-labelled stilboestrol, and of an intact steer fed 10 mg. stilboestrol daily for 11 days. Approx. 20% of the radioactivity was excreted in the urine and 30% was recovered from the faeces. Only traces of activity were found in the bile of the fistulated animal. Separation of the radioactivity into free phenolic and conjugated fractions revealed that stilboestrol was present in urine and bile primarily in conjugated form. The radioactive phenolic material was identified as stilboestrol, and its concentration in parts per thousand million was 0·3 in lean meat, 0·35 in fat, 9·12 in liver, and 4·15 in kidney.

Glascock, R. F. & Hoekstra, W. G. (1959). **Selective accumulation of tritium-labelled hexoestrol by the reproductive organs of immature female goats and sheep.**—Biochem. J. **72,** 673-682. [Authors' summary modified.] 591

Hexoestrol labelled with tritium was injected s/c into immature female goats and sheep in physiological doses. The excreta and certain tissues were assayed for radioactivity at intervals after injection. Radioactive hexoestrol was rapidly absorbed and excreted into the urine and into the intestinal contents and faeces by way of the bile. It was selectively localized in organs known to respond to oestrogens, in the organs of excretion and reabsorption of hexoestrol and also in ovaries and oviducts. Although the uterus and vagina had higher concentrations than any other organs, the maximum percentage of the total dose accumulated by them at any time was less than 0·2.

Croes-Buth, S., Paesi, F. J. A. & De Jongh, S. E. (1959). **Stimulation of ovarian follicles in hypophysectomized rats by low dosages of oestradiol benzoate.**—Acta endocr., Copenhagen **32,** 399-410. [In English.] 592

Small and medium sized follicles were stimulated by 0·5 μg. oestradiol benzoate inj. s/c daily for 6 days.—R.M.

Raeside, J. I. & McDonald, M. F. (1959). **Seasonal changes in the oestrous response by the ovariectomized ewe to progesterone and oestrogen.**—Nature, Lond. **184,** Suppl. No. 7 pp. 458-459. 593

Spayed ewes were given 10 mg. of progesterone daily for 3 days and 40 hours later 10–80 μg. of oestradiol benzoate. Oestrus did not occur in those given only 10 μg. oestradiol but in the remainder the percentage marked by rams was much greater during the oestrous season than in the season of anoestrus. Crystallization patterns in the cervical mucus were found in almost all the ewes after treatment.—M.G.G.

Spies, H. G., Zimmerman, D. R., Self, H. L. & Casida, L. E. (1959). **The effect of exogenous progesterone on formation and maintenance of the corpora lutea and on early embryo survival in pregnant swine.** — J. Anim Sci. **18,** 163-172. 594

Experiments on 82 gilts, slaughtered when 4–25 days pregnant, showed that injection of progesterone at 1 mg./ lb. body wt. during the first 25 days of pregnancy had no influence on the proportion of ova that became implanted.

—R.M.

Hoshino, T. & Toryu, Y. (1959). **Sex chromatin in domestic animals.**—Tohoku J. agric. Res. **9,** 113-125. [In English. Authors' summary modified.] **595**

Sex differences in nuclear morphology were examined in cats, pigs, goats, cattle and horses. Sex chromatin appeared in about 80% of female nerve cells, but rarely in male cells. It was divided into 3 types according to position. In the first type it was adjacent to the nucleolus, in the second adjacent to the nuclear membrane and in the third free in the nucleoplasm. In sows it was found in most cells of the non-nervous tissues, with the exception of ovarian follicular cells. In mares it was detected only in the epithelial cells and the smooth muscle cells in the duodenum, but in no cells in cows. It is suggested that the female sex chromatin consists of heterochromatic portions of the XX chromosomes.

*See also absts.* **362** (vibrionic infertility in turkeys); **364** (sheath rot in sheep); **410** (abortion in mares in Japan); **502** (sterility in starved mice); **576** (physiology and bacteriology of the cow's uterus); **603** (book on reproduction in domestic animals).

## REPORTS

Great Britain. (1959). **Report of the Agricultural Research Council for the year 1957-58.** pp. 173. London. H.M. Stat. Off. 8s. **596**

The Council has continued its efforts to achieve co-ordination between its work and the needs of agriculture. The Council in May 1957 set up a Veterinary Therapeutic Testing Board, similar in function to that of the Medical Research Council, but the response has been disappointing.

Meat production presents problems urgently in need of more work. They fall into two parts: the breeding, rearing and feeding of cattle, sheep and pigs; and the slaughter, handling and processing of the carcasses.

Probably no branch of agriculture has expanded at the same speed or to the same extent as poultry. To-day between 50 and 70% of the birds kept for commercial egg production are intensively housed, while in the table-poultry industry the figure must be close on 100%. As regards poultry diseases Fowl Paralysis and Leucaemia dominate the picture, but Respiratory Diseases are also very troublesome and can spread quickly.

Work has been carried out on the immunization of cattle against Husk. Vaccines and antisera have been widely used against viral and bacterial infections but they have not been applied to parasitic diseases. With certain helminth infestations it has been shown that the injection of immune serum into susceptible animals confers passive immunity. From work on these lines it appears that partially inactivated larvae can engender immunity in some helminth infections.

At the Field Station at Compton work has been done on Brucellosis and the use of Strain 45/20; in Mastitis in cows, Scrapie in sheep and Pneumonia in pigs.

The Foot and Mouth Disease Research Institute reports the examination and immunological classification of 2,200 samples from 1948 to 1958, from outbreaks in Europe, Africa, Asia and the Americas; four new types of virus were revealed.

At the Animal Diseases Research Association in Edinburgh, the work has mainly been concerned with Johne's Disease in cattle and sheep, Sheep Pneumonia and Scrapie. It has been confirmed that scrapie is transmissible in series to sheep by inoculation. The disease can be transmitted after the inoculum has been heated to 99·5°C. for 8 hours. A breeding experiment indicated a high correlation in incidence of scrapie between parents and offspring.

In field observations by the Parasitology section, no significant difference has been found in helminthological status as between set-stocked animals and those grazed on a rotation period of seven days.

—D. S. Rabagliati.

Nyasaland. (1959). **Annual Report, 1958. Department of Veterinary Services and Animal Industry.** [Faulkner, D. E.] pp. 60. Zomba, Nyasaland: Govt. Printer. 5s. 6d. **597**

Although the tick-borne diseases caused most losses, Rabies figured most in the public eye. The formation of a Rabies Control Unit, consisting of several vaccination and dog destruction teams for mass campaigns in the rural areas, was the most important measure taken during the year.

There was a sharp increase in rabies, more

apparent in the Southern Province, where 75 cases in all were confirmed, and many more have gone undiagnosed in the rural areas. Four people are known to have died of the disease.

There was a net increase in the number of African-owned cattle from 316,000 in 1957 to 329,000 in 1958 (increase of 4%), and an increase of 2,900 of European-owned cattle (increase of 26%).

The most important tick-borne disease was East Coast Fever although Heartwater can be even more devastating to the individual owner, particularly in the Southern Province, where East Coast fever is not endemic. Although the total number of cases does not show a decline, the number in areas where dipping is practised has fallen in the period recorded. The policy is to use dipping tanks, not only for disease control but also as points from which extension work on many animal husbandry problems can best be carried into the surrounding areas.

The highest incidence of Tuberculosis is in the North Province. Roughly 5% of the animals slaughtered at Mzimba are condemned for TB. In general the Southern Province may be considered free.

The report contains eleven excellently reproduced photographic plates and eleven tabulated appendices.—D. S. Rabagliati.

Israel. (1959). **Ministry of Agriculture Dept. for Veterinary Services and Animal Husbandry. Report for the year 1958, Division of Infectious Diseases.** [Goor, Y. S.] pp. 13. The Ministry. [In Hebrew and English.] **598**

The field veterinary services have made considerable progress in the eradication of epizootics under very difficult conditions.

There were 13 outbreaks of Foot and Mouth Disease which entered from neighbouring countries. The slaughter policy was not enforced and in view of the confusion as to the type of virus responsible, most of the grade stock in the country was vaccinated with bivalent A/O vaccine and later with C/O or C/A vaccine, or monovalent A. In all 203,390 injections were given. The appearance of the Asian type of virus in the country must be viewed with concern because there is at present no vaccine available.

A campaign is carried out against Tuberculosis by means of the tuberculin test. The number of tests has increased both in dairy and beef herds. In infected areas the owner can apply for tests, but in the other areas the tests are compulsory. Johne's Disease is not a serious problem but has been found in sheep during the year, and also in one goat.

Tick-borne Diseases, and bovine and ovine Brucellosis also occur. During the year 35,329 cattle were vaccinated with *Br. abortus* Strain 19, and 12,605 blood samples were examined by the agglutination tests.

There were two fatal cases of Anthrax and 211,189 injections for immunization of stock and of this number 104,000 were sheep and goats owned by Bedouins.

Sheep Pox occurred in a number of flocks and 13,334 sheep were immunized.

Rabies remains a public health problem and 37 cases were diagnosed in animals (25 in dogs, two of which had previously been inoculated with vaccine). 11,743 dogs were vaccinated, a very small proportion of the dogs in the country and 20,884 dogs and 2,283 cats were destroyed.—D. S. Rabagliati.

## BOOK REVIEWS

Oginsky, E. L. & Umbreit, W. W. (1959). **An introduction to bacterial physiology.** pp. xii + 443. San Francisco: W. H. Freeman & Co. London: Bailey Bros. & Swinfen Ltd. 2nd edit. 64s. **599**

This book has undergone many changes since the first edition in 1954 [*V.B.* **25,** 553], mainly to bring it up to date. Additions have increased the number of pages by 40. It can be recommended to students of bacteriology.
—R.M.

Collins, D. H. [Edited by.] (1959). **Modern trends in pathology.** pp. 334. London: Butterworth & Co. Ltd. 70s. **600**

The following reviews in this book will be of special interest to veterinary research workers :— The injured cell, by R. Cameron; Examination of pathological tissue in a fresh state, by R. J. V. Pulvertaft; Injury to connective tissue, by D. M. Angevine; Localization of antibody production, by C. L. Oakley; Endogenous mechanisms in the acute inflammatory reaction, by W. G. Spector; Movements of neurotoxins and neuroviruses in the nervous system, by G. P. Wright.—R.M.

Hoskins, H. P., Lacroix, J. V. & Mayer, K. [Edited by.] Bone, J. F. & Golick, P. F. [Revised by.] (1959). **Canine medicine. A**

**text and reference work.** pp. 854. Santa Barbara, California: American Veterinary Publications, Inc. 2nd edit. revised. $18. **601**

This book is made up of contributions by 43 well-known authors, including a British and a Swiss graduate, senior members of teaching staffs of veterinary and medical establishments, research workers and practitioners. The opening chapter, on clinical examination, contains some very sound advice on history taking, diagnosis and report to the owner, of benefit to recent and old graduates alike. This is followed by 27 chapters on the administration of medicine, nutrition and diseases of the various systems, organs and tissues, metazoan infections, diseases caused by fungi, rickettsia, spirochaeta, bacteria, viruses, and by physical and toxic agents. There are two new chapters on pediatrics and parenteral fluid therapy and, in the remaining chapters, geriatrics, euthanasia and inhalation therapy are discussed. Neoplasms are dealt with in the chapters on the organs or tissues affected. In each chapter the tables and illustrations are numbered and the text is followed by numerous references. This work is well indexed, liberally interspersed with illustrations which, on the whole, are of a good standard, and is equally suitable for the student, if he can afford $18, and for the practitioner.—T.E.G.R.

Biester, H. E. & Schwarte, L. H. [Edited by] (1959). **Diseases of poultry.** pp. xiii + 1103. Ames, Iowa: Iowa State University Press. 4th Edit. $14.50. **602**

A new edition of this outstanding book is an important event.

The arrangement of the text is on the same lines as in the past but there are new authors for some of the chapters. Although much new material has been included the number of pages has been reduced by some 10% but it is still a very large book (1,076 pp. of text and 24 of index). One wonders whether in future editions some changes might be possible in order to reduce the size. Possibly the first six chapters which cover 125 pp. and chapters 37/38 could be omitted without affecting the value of the book to research workers. Possibly some economy in space would be possible by dealing with pullorum disease, fowl typhoid and other salmonella infections in one chapter instead of three. A chapter on the diseases of waterfowl would be useful to many readers.

Among the diseases which are included for the first time are vibrionic hepatitis and infectious synovitis. The text is set out in two columns to the page instead of across the page as in former editions. This is one of those books of such acknowledged authority that it is unnecessary to praise it; workers on poultry diseases throughout the world owe a great debt to those whose labours have put such an efficient tool at their disposal.

Cole, H. H. & Cupps, P. T. [Edited by.] (1959). **Reproduction in domestic animals. Vol. II.** pp. xi + 451. New York (& London): Academic Press. $13.00. **603**

The first volume of this work was good, but this second volume is much better. Like all text-books this is inevitably about two years out of date by the time of its appearance. This is particularly true of the spermatogenesis chapter by Ortavant; the 143 references quoted show that the literature is well considered up to 1956 but subsequently only skimmed; however, the chapter by T. Mann on semen biochemistry covers the literature up to and including 1957. In considering the work of Werthessen *et al.* on stallion semen, Mann does not discuss these workers' contention that the tail end sample as collected in Kentucky differs from that as collected at Newmarket. The whole chapter is perhaps too concise.

L. E. Rowson has perhaps unrivalled experience of semen collection and storage technique, and libido in the bull, and has made full use of it in these two chapters. The section on dog semen is less complete but the horse section is adequate though the Russian claim that use for ordinary work inhibits the sexual function of the stallion is not discussed. The discussion on inhibition in bulls is most informative.

J. O. Almquist on insemination techniques is sound on cattle, but to state that there has been "general neglect of goat A.I." is hardly fair to the German workers. In timing of insemination of cows, the differences due to a tropical environment are not considered. Sheep A.I. is not, as claimed, practised commercially in Britain. The section on pigs is of less value than the rest as there has been so much recent progress.

J. Moustgaard's chapter on nutrition and reproduction is very good. The falsity of claims that vitamin E is significant in farm animal breeding is exposed. A little more might have been said on the roles of manganese, copper and iodine in reproduction.

M. T. Clegg & W. F. Ganong contribute a short chapter on other environmental factors; they discuss delayed implantation in interesting detail.

Two chapters on reproduction in fowls make for completeness in the work and appear well up to its general standard.

The chapter on specific genital infection by Hart & Osebold is confined rather strictly to the situation in the U.S.A. The sections on brucellosis and leptospirosis are adequate. The Dutch pioneer work on vibriosis is ignored, treatment of bulls is undervalued and too much faith placed in the addition of antibiotics to semen, a recommendation based solely on the results of McEntee *et al.* (1954). There is an excellent section on listeriosis; and more about toxoplasmosis than its importance seems to justify, while *Salmonella, Corynebacterium,* fungal and *Pseudomonas* infections are barely mentioned. Virus infections of the type described *inter alia* by Millar, infections by pleuropneumonia-like organisms, and by the haemolytic cocci are ignored.

J. P. Mixner has successfully condensed an account of anatomical and physiological infertility factors into 18 pages. Emphasis is properly placed on the probable detrimental effects of high production, on the breeding function. Again treatment of bulls with vibriosis is unduly deprecated in favour of semen antibiotics. Mixner suggests that the "decreased neutral steroids" excretion by nymphomaniac cows, reported by Garm, reflected a decreased consumption of hay. The reviewer however has noticed no decrease in consumption in the course of feeding some 70 such cases over a period. Priority in the application of progesterone to the control of early foetal death is ascribed by implication to Hawk *et al.* (1955), whereas Herrick (1953) published some relevant observations followed by the reviewer (1954) in rather more detail.

Mistakes in spelling and initials of names in the extensive lists of references are rather frequent.—F. L. M. Dawson.

Smythe, R. H. (1959). **How animals talk.** pp. 109. London: Country Life Ltd. 18s. **604**

The author refers briefly to miscellaneous modes of communication between individuals of various species of insects, birds and mammals. The squeal of the piglet alerts all the other pigs, and ewes and lambs recognize each other's voice. The main value of the book, which is not intended for the specialist, lies in the accounts of the author's personal observations on individual animals. His animals were not kept under the controlled conditions demanded for much research work but were free in their (man-made) environment and, by virtue of confidence in their owner, free from fear. The disadvantages in such methods are apparent. The advantages are that the author was able to observe the behavioural abilities of his many individual animals over an extended period in such an environment.

The author gives his own methods of gaining the confidence of strange horses and dogs. He tells of the increased understanding arising between trainer and dog-trainee on their continued close association with one another. Animals appreciate change of tone in the trainer's voice. Horses like to be talked to.

He has no sentimental illusions about animals, drawing attention to their inability to appreciate death or the slaughter in slaughter-houses of their companions and to the selfish behaviour of a horse at feeding-time towards its othertimes bosom companion. On the other hand, he does not rule out the possibility of psychic communication between cats.

—A. Brownlee.

Mason, M. M. (1959). **Bibliography of the dog.** pp. iv + 401. Ames: Iowa State University Press. $6.00. **605**

The editor of this book disarms the critic in the first paragraph of the foreword where he says "A subsidiary title of this work might well be—'Fools rush in where angels fear to tread' " and, further on, the work has been undertaken "in spite of advice from well-qualified men".

It has many defects stemming from over-ambition and apparently lack of technical knowledge of the intricacies of preparing an efficient index.

The attempt has been made to cover the whole literature on the biology of the dog in one volume in order to render a service to medical and laboratory workers interested in the diseases of the dog and to make available to veterinarians recent literature on physiological and pathological studies.

As a guide to the literature it is very unsatisfactory. Many examples to justify this criticism could be cited but one must suffice. Take the case of a user who wished to find references to *Babesia gibsoni.* When he looks up *Babesia gibsoni* in the subject index he finds one entry. However if he works through such other entries as Babesia; Babesiosis; Piroplasmosis; Ticks; he will find three others. In running these down he will have to depend entirely on his own knowledge as there is no attempt to guide him by any system of cross referencing or grouping of headings. One gets the impression that the entries were arranged by purely clerical workers

who were unaware that for example the words "Babesiosis" and "Piroplasmosis" are almost synonymous. A very irritating feature of the work is exemplified by the entries under such a heading as "Distemper"; here the reader is faced with 36 lines each containing 6 numbers with no indication of the nature of the entry he may expect to find under any of these numbers. That he can do only by laboriously turning up each of the 216 entries.

There are many omissions: had the book been confined to the diseases of dogs and had the staff responsible for collecting the material been guided by experienced and qualified leaders something of value might have been achieved.

There are 304 pages of bibliography with some 12,000 entries and 97 pages of subject index.

Printed on good quality paper and nicely bound, the book is priced at six dollars.

## BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

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Dunsford, I. & Grant, J. (1959). **The antiglobulin (Coombs) test in laboratory practice.** pp. xiii+120. Edinburgh (& London): Oliver & Boyd. 12s. 6d.

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Schmidt, H. (1959). Das Properdin. **[Properdin.]** pp. xi+150. Darmstadt: Dr. Dietrich Steinkopff Verlag. DM 28.

Wunderly, C. (1959). Die Papierelektrophorese. **[Paper electrophoresis.]** pp. 202. Aarau (& Frankfurt): H. R. Sauerländer & Co. 2nd Edit. DM 18.80.

Printed by Charles Burrell & Son, The Castle Printing Works, Chertsey, Surrey

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Zipkin, I., 845.
Zlotnik, I., 674.

## ERRATA

*V.B.* **29**, abst, 3112, line 14 of abst. The words: "A haemagglutination test" should be replaced by: An agglutination test.

*V.B.* **30**, abst. 424. First author's name should read: Sasahara, J.

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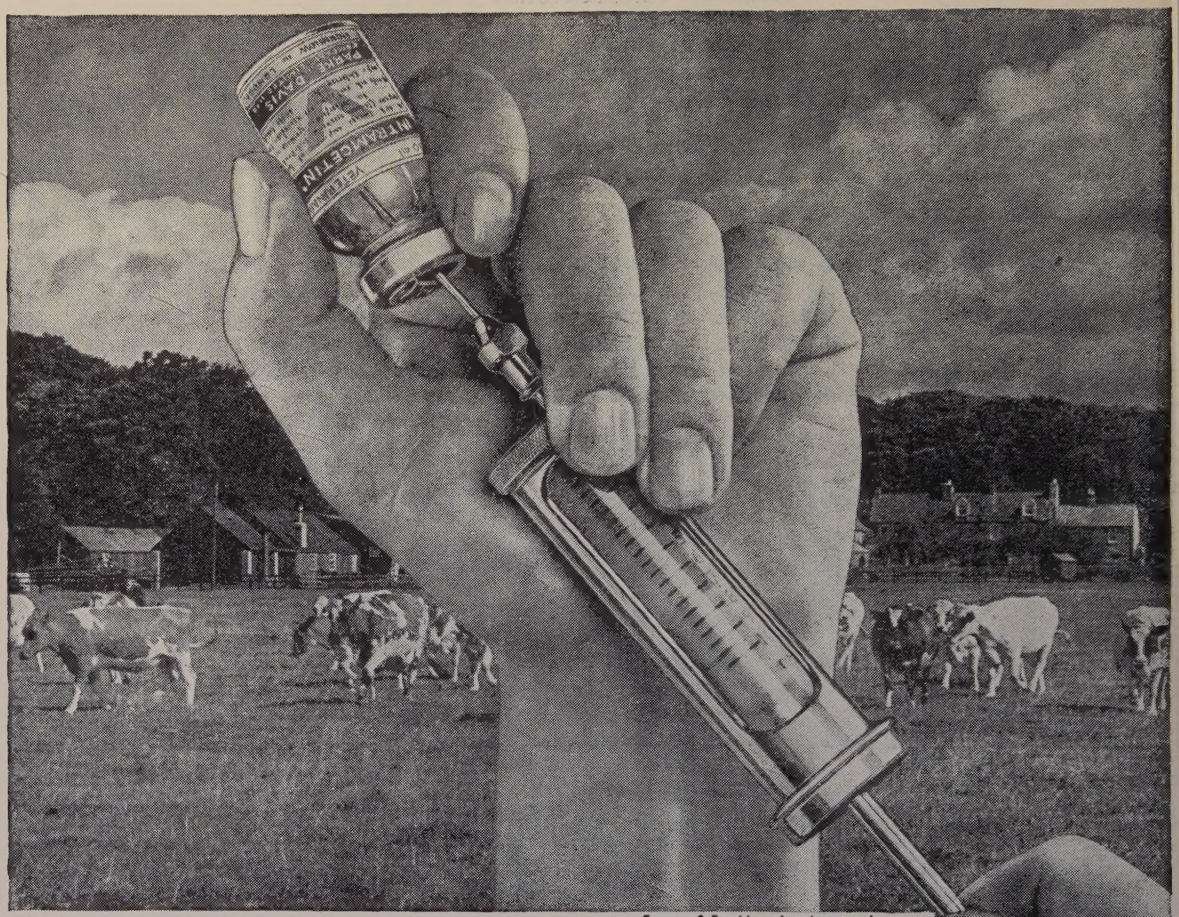


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